

Motorola's New Mac: How the StarMax Rates...page 33

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MacUser

NEW!

PowerBook 1400

Road Tested

Has Apple fixed the PowerBook?

We go on the road, under the hood, and into the lab to find out

PLUS

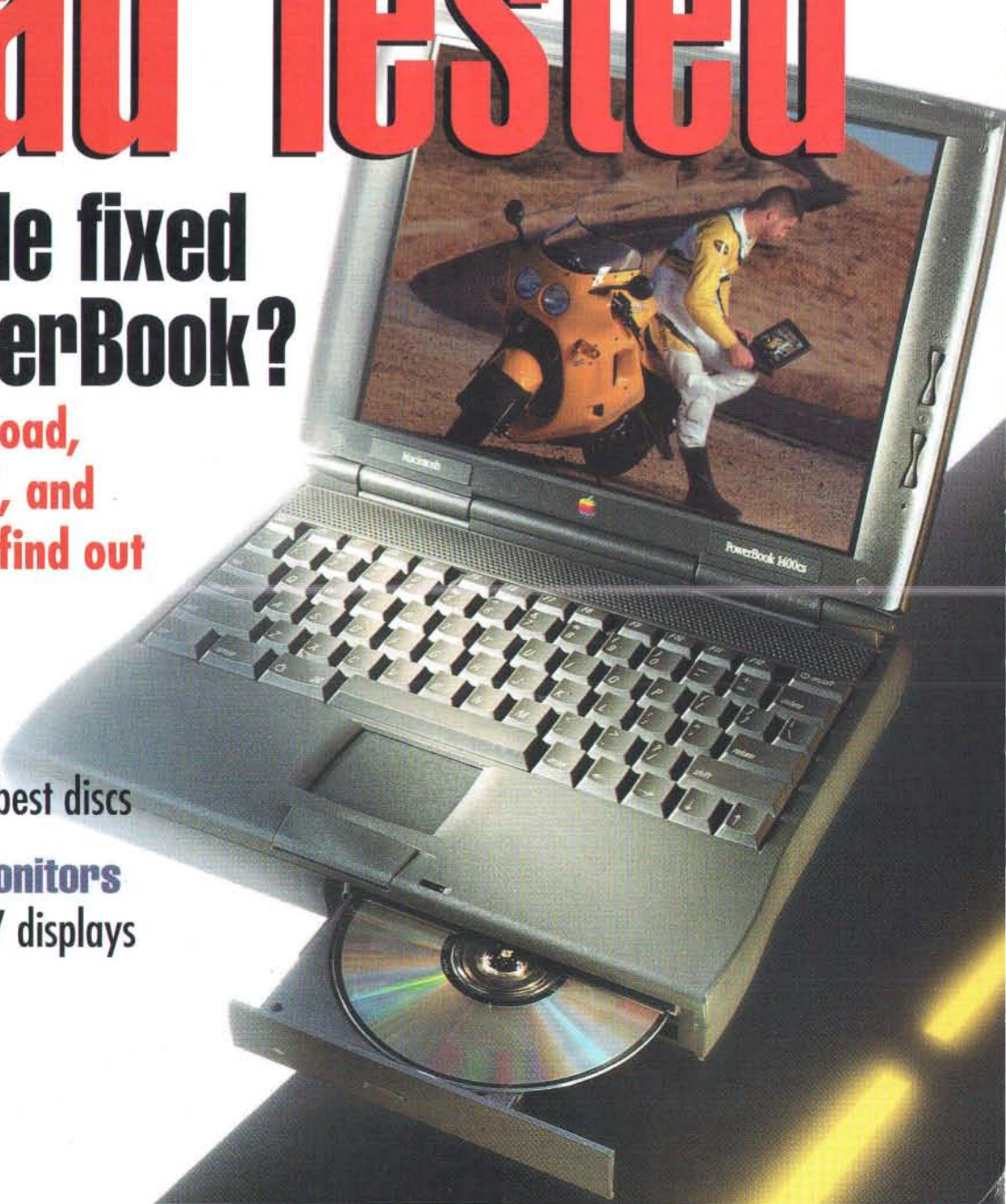
Top 50 CD-ROMs

We spin the year's best discs

17-Inch Color Monitors

Buyer's Guide of 47 displays

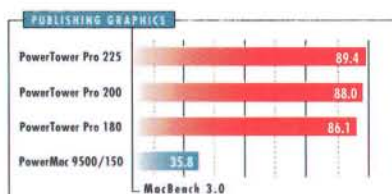
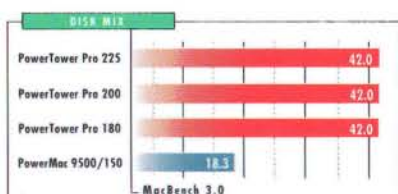
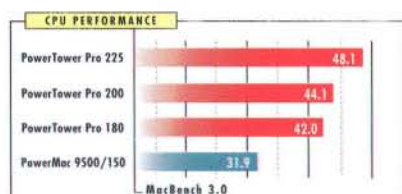
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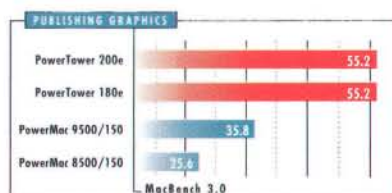
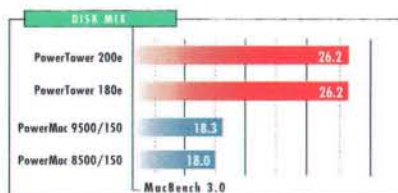
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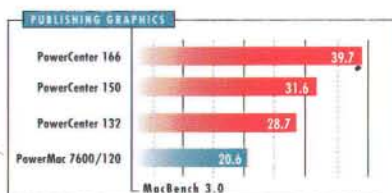
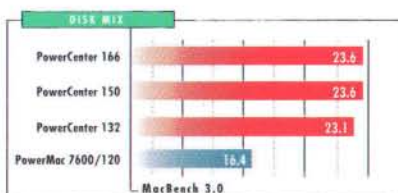
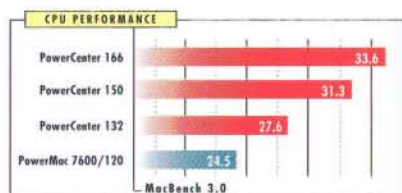
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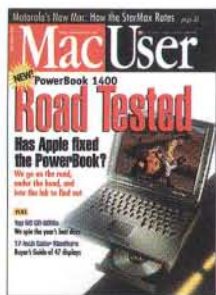
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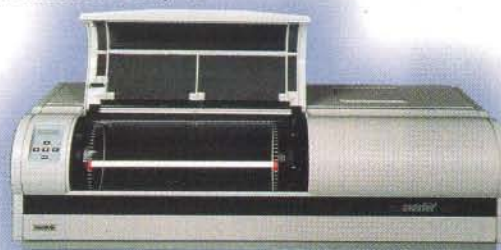
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On the cover / The PowerBook 1400 has a removable BookCover that lets you customize your Mac. Check out our free BookCover cutout, on page 73.

Cover photo / Steven Underwood

Screen photo / Giampiero Benvenuti



COVER STORY

ROAD TEST: THE APPLE POWERBOOK 1400

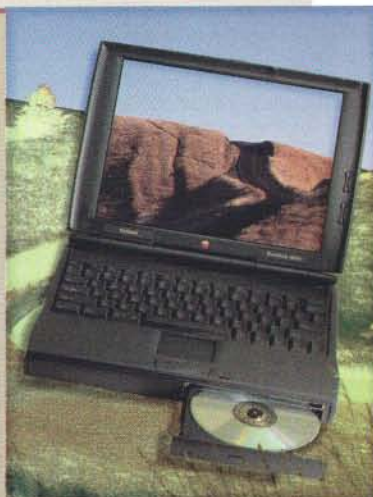
Is the latest incarnation of the PowerBook the one you'll take on the road?



Apple needed to burn rubber in order to make up for its last foray into the PowerBook realm.

The PowerBook 5300 was plagued with problems from the get-go. Is the PowerBook 1400 the comeback kid? We hit the road to find out.

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MacUser's 1996 Top 50 CD-ROMs

We've upped the ante on quality, basing our judgments on content, production quality, ease of navigation, innovation, and enjoyability. And only those CD-ROMs that qualified as four-mousers made the final cut. We're sure you'll find several you'll want to take for a spin. By the editors of MacUser / 82



The Burden of Proof



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17-Inch Monitors: The Bigger Picture



We rounded up almost four dozen 17-inch monitors and put each one through an arduous screen test, judging color tracking, brightness, MTF sharpness, and more. By Jeff Pittelkau / 108

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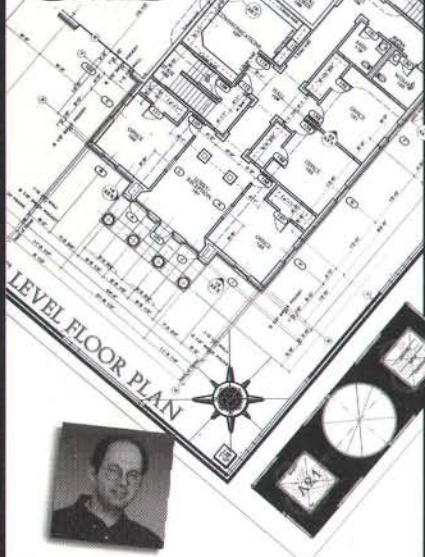


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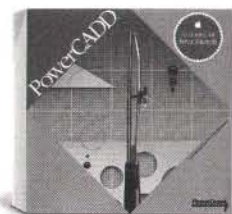


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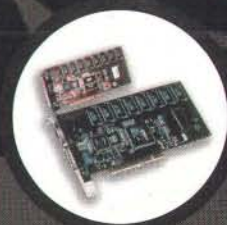
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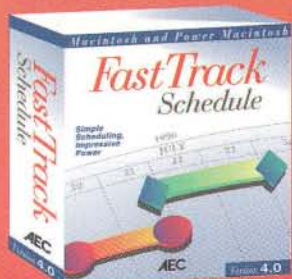


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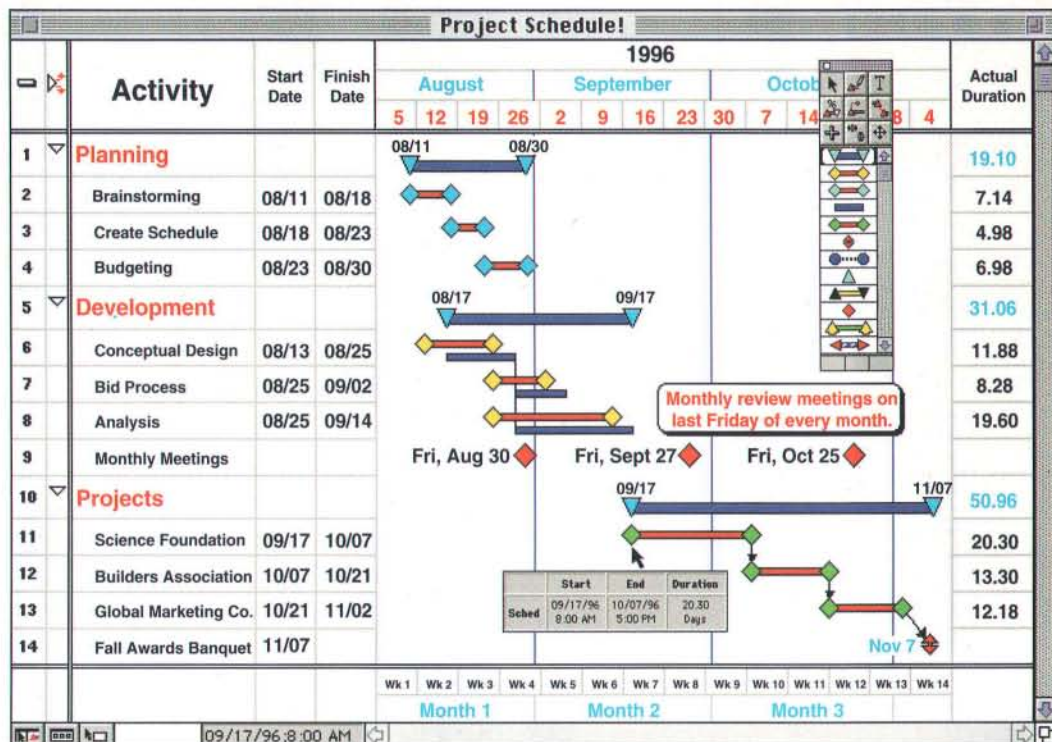
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LETTERS

A Bunch of Crybabies

APPLE JUST CAN'T WIN! Two years ago, you folks in the press were crying that Apple should be embarrassed because there weren't any clone makers. Last year you were crying that Apple should be embarrassed because there weren't *enough* clone makers. And now, you're crying that Apple should be embarrassed because a clone maker is being successful with innovative Mac OS products (Mac OS Systems, September '96, page 37). Why should Apple be embarrassed by the success of a technology that it invented and that it will see into the next century?

Your glowing review of the Power machine just goes to show that the press — even the *Macintosh* press — loves to take even the best news about Apple technology and turn it into something negative. Apple should be proud of Power's awesome achievements with the Mac OS. Product diversity and innovation are the whole reason for having clones. As is so often pointed out by the media, Apple cannot do everything.

David Simerly
beowulf@ponyexpress.com

Apple's Shelf Life

ONE OF YOUR READERS suggested that Apple should ask retailers to display mail-order catalogs next to the Macs they sell (Letters, September '96, page 13). Why not go one better and include a mail-order catalog for, say, MacWarehouse with every Macintosh sold? Or if Apple wants to avoid being partisan, it could include catalogs for several major mail-order retailers. That way, people would know right off the bat that there is a lot of software available. And when Cyberdog is bundled with

the Mac OS, Apple could even put Cyberian Outpost's and MacMall's URLs into the default notebook.

I think Apple does need to convince developers that they should stay, but more urgently, it needs to convince buyers and potential buyers that there is a whole bunch of software available — you just have to go mail-order.

Noah Daniels
ndaniel1@swarthmore.edu

IT INFURIATES ME THAT Apple is slipping slowly from the scene. It is absolutely true that the Apple section (hardware or software) in most computer stores is almost nonexistent and that if people have a computer at home, it is usually a PC clone.

Even my most die-hard Mac friends are moving to the Windows environment. They have no choice. The letter commenting about software available in the catalog environment does not cut it. (Even in the MacConnection catalog, the amount of software listed for PCs as compared to Macs is much greater.) The catalog environment is not where the public buys its stuff. The public goes to the local discount store. People may become catalog buyers later, but when they shop for a computer, they start looking in the closest computer store. True, most CD-ROMs are still being written to be compatible with Macs as well as PCs — but for how long?

Right now, I am considering buying a computer for my son and his family, who do home schooling. Frankly, I may have to consider a Windows-based machine. I can get a new 100-MHz Wintel system, complete with a monitor, a CD-ROM, a fax modem, telephony capabilities, and lots of software, for \$999. Local retailers always carry specials on Packard Bells, Compaqs, Gateway 2000s, or some such total system that includes tons of software. They only occasionally carry Macintosh ads, and when they do, the ads often say to "call for pricing."



Open Folder

As humankind has evolved and as Mac users have ascended to the top of the biological pyramid, certain body parts and organs (tonsils, pinkie toes, the appendix, the funny bone) have become vestigial in us higher primates. *The funny bone?* you ask. Unfortunately, yes. Judging by several readers' response to our September Open Folder, humankind's sense of humor is going the way of the prehensile tail. Our misquoting of the Beach Boys and misnaming of the vintage TV show *Car 54, Where Are You?* were intentional, for those of you wondering what that whooshing sound was just overhead. We admit that the gag was not our biggest rib-tickler ever, but it was a gag nonetheless. (Speaking of old TV, remember that episode of *Gilligan's Island* — the one in which the castaways hatch a plot to get off the island but just when they're about to succeed, Gilligan does something stupid and ruins everything?)

Advertisers, beware: The advanced evolutionary state of Mac users makes your marketing attempts at humor as dangerous as our editorial attempts. Big Island Communications, maker of the YoYo telephony package, got a stern finger shaking from reader Ruth Foss, who objected to the company's ad in our October issue. The ad, for those who don't remember or didn't get it, makes light of that societal linchpin, The Mother-in-Law. And although it might not exemplify the highest form of human thought, we appreciated the ad's anthropological value — it's a bit of living history.

However, an ad in the July 21 *Toronto Sun* best demonstrates the relationship between humor and evolution. The piece, from Jeffrey Stephen, reads, "Bill Gates Unplugged: Come Hear How a Man and His Mouse Revolutionized the World." Revolutionized the world? Now *that's* funny, and it further supports the notion that ontogeny recapitulates phylogeny. For as Bill Gates and his kingdom of *Micro sapiens* grow to full development, they're exhibiting not only the technical prowess but also the sense of humor that was characteristic of the proto Mac user.

WRITE TO LETTERS

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The Mac truly has been a much better machine, and I shudder to think of the millions (billions?) of taxpayer dollars that have been spent in the education sector teaching people how to use DOS and Windows when everyone could have been using Macs all these years.

Apple doesn't seem to realize that the world is not what it was when the Mac came out. Buyers today are saying, "A Mac? I thought Apple went out of business." I heard such comments almost daily this spring in my college — and not from the computer literati poking fun at me but from the lay public, students, and staff. It was not a dig. It was what they really believed.

Ruth Miller
Camino, CA

Oh Lord, Won't You Buy Me a Mercedes-Benz?

MY FATHER-IN-LAW recently gave me a nice AMD 133 PC with all the fixings. He was showing me all the stuff it could do, such as telephony, faxing, and videoconferencing. The problem was that this didn't impress me, because I had been able to do this stuff on my Mac for a long time. The interesting part is that he can do everything I can do on mine, but it ends up costing him more time and money in every instance. Not to mention that he has to become an expert on every aspect of how everything works, just in order to make it work.

Sure, you can find more software for the PC than for the Macintosh. That's because there are more PCs out there. On the other hand, there are a lot more Fords out there than there are Mercedes. Mercedes is more about quality and engineering than market share. Mercedes sells a superior product for more-scrutinizing clients, who expect more than just a thing that gets you from here to there. That's what the Mac is all about. Let's hope so at least.

Dee Golden
via the Internet

Confessions of a Convert

I'M CONSIDERING apostasy. Although I still profess Macintosh to my friends, my heart feels a strong tug toward Windows. In the past, my household, our Mac, and I endured against all kinds of persecution. But this time around, I feel like I'm faltering.

I've worked for the last six years in computer sales and tech support for Macs and PCs.

I've been using Macs since 1984, and like most people who have been forced to use both Macs and PCs, I still prefer the Mac.

Here's the shocker, though: I recently did a thorough comparison between the top-equipped Macs and their Pentium counterparts. I couldn't believe the difference in price, *for the same stuff or better*.

I still think the Mac OS is superior to any Windows OS. But that's just about all the Mac has to its credit anymore. Nowadays, you can do just about anything on a PC that you can on a Mac. Even the time it takes to configure a PC has greatly decreased. I know. I set up PCs at work. In real-life usage, PCs run as fast as or faster than Macs — and at almost \$2,000 less! Even most mainline Mac software is available for the PC.

So, comparing apples to apples (no pun intended), why would I want to buy a Mac next time? Why would anyone do it, unless they had lots of extra money to throw around to get their favorite OS. Apple (and the rest) have been and *still are* charging too much for a dying Mac religion. I hope the company can wake up before it's too late.

Rick J. Vogel
via AOL

Back to the Future

SUPERB UPDATE ON THE current state of Apple and where it's heading ("Looking into Apple's Future," October '96, page 66). My faith has taken some hits lately, but after reading this feature, many others and I are sure to be rejuvenated.

Communicating established advantages and up-and-coming technologies to potential customers is essential to the Mac's long-term success.

Brian T. McNamara
brimac@onramp.net

StrongARM Tactics

IN THE NEWTON PORTION of "Looking into Apple's Future," you stated that the StrongARM processor will arrive at 160 MHz and is expected to be available before long in excess of 200 MHz. Your readers should be aware that Digital is currently shipping a 200-MHz version that consumes only half a watt of power at full speed. You can find relevant information on the Digital Web site: <http://www.digital.com:80/info/semiconductor/dsc-sa-110.html>.

Steve Bakke
bakke@ma.ultranet.com

Director Miscast?

IN READING YOUR recent comparative review of Macromedia's Director and mTropolis's mTropolis ("mTropolis Upstages Director," September '96, page 68), I was very disappointed to see that there were several errors and omissions in the article, including the following: The article states that Director has no text-to-bitmap conversion. This is not true. Director supports this feature. The article states that Director does not support palettes. Palettes have been supported by Director since 1987. The article states that Director doesn't support drag and drop between casts. Director does support drag and drop between casts as well as into Director from the desktop. Also, Director supports an unlimited number of multiple external casts. The article says that Director does not support object messaging. Actually, Director has supported object messaging, through Lingo, since 1990. The article fails to say that any new mTropolis object requires creation in C or C++. Most creative professionals are not programmers, and the statement "no scripting is required with mTropolis" is false for any reasonable title. More significant than any of the features reviewed is cross-platform authoring and delivery as well as delivery on the Web. mTropolis fails on all scores, despite repeated promises to the contrary.

In recent issues of your magazine, mTropolis was given a rating of 3.5 mice (see review, July '96, page 46) and Director 5.0 was given a rating of 4 mice (see review, August '96, page 44). In the comparative article, however, mTropolis' rating was bumped up to 4.5 mice. As you know, many people look to *MacUser* as their source for impartial, well-researched product reviews. Articles such as this one do a disservice to your readers by failing to present a complete comparison of the two products.

Bud Colligan, Chairman and CEO, Macromedia
San Francisco, CA

/ You're right and we were wrong on the first two counts — Director does convert text to a bitmap as it creates a player file, and it does have palettes. However, you can't drag and drop objects between two projects, as you are able to with mTropolis, because Director allows only one file to be open at a time. And our point about object messaging emphasizes a key advantage of mTropolis' object-oriented architecture — interactive titles can be built without scripting. Its architecture is what makes mTropolis the tool of choice for constructing sophisticated video games and other complex commercial

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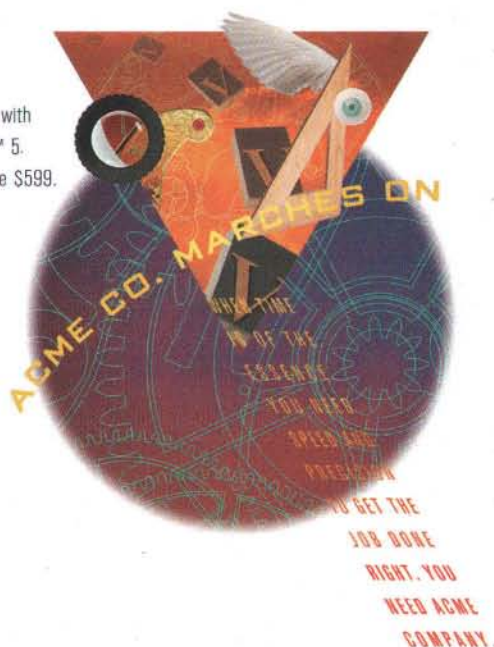
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Mark Hall
Editor in Chief
Macweek
July 24, 1995

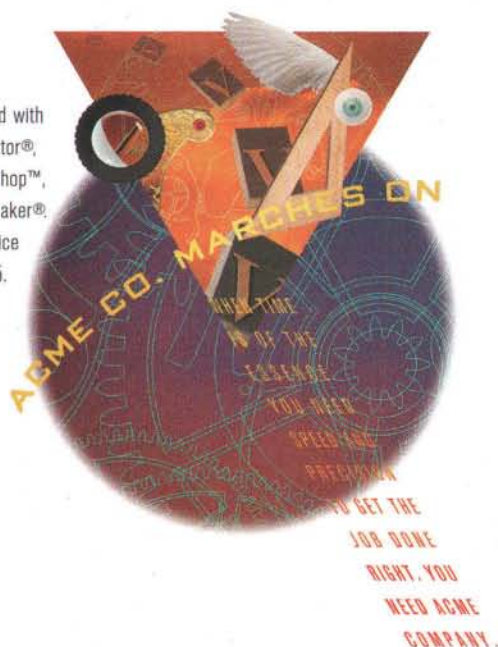
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Keith Boncek
Director of Computing
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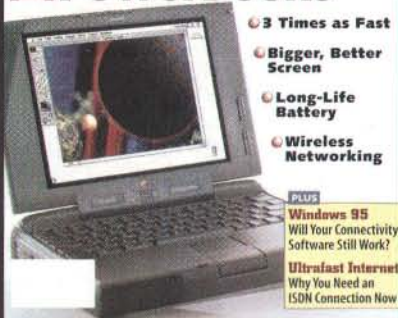
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titles. Director, on the other hand, remains an excellent tool for creating interactive business applications. By the way, the apparent discrepancy in mouse ratings for mTropolis is not really a discrepancy at all — we gave 3.5 mice to version 1.0 of mTropolis in July; the September article rated version 1.1 of the product. / SJ

Eudora Pros and Cons

I READ AND AGREED with your review of Eudora Pro 3.0 (see review, October '96, page 61). But by seemingly comparing it only with Claris EMailer and neglecting Netscape Navigator, you missed the bigger picture.

I too scoffed at Navigator's mail functionality when the browser first appeared. However, the product has grown considerably in features and in the quality of its user interface. In fact, about half the people in my office have switched from Eudora Light or UNIX Pine to Navigator as their e-mail client software. Navigator's ability to render HTML within a mail message is a very nice feature, especially for folks who make their living creating Web sites. With Navigator's Java, JavaScript, and HTTP capabilities, you can create incredibly rich e-mail messages and versatile work-flow solutions for little money.

Navigator has come this far in a little less than two years; it took Qualcomm almost three years to come up with Eudora 3.0, which is at best a more refined and extensible version of 2.0. The rate of innovation at Qualcomm isn't keeping up with Netscape's pace, and I'm afraid that Eudora doesn't have the rich variety of other technologies upon which it can leverage itself.

However, your readers may never give Navigator's e-mail capability a try because they'll have been led to believe that the race is between only Eudora and EMailer.

Blake Sobilloff
via the Internet

/ We'll have to call it a difference of opinion. I see very little use for Java and JavaScript within e-mail right now, and I consider Navigator's e-mail interface so poor that I'd never recommend it over Eudora Light, let alone Eudora Pro. You may be right that momentum is on the side of Netscape and other vendors of e-mail client software, but right now Eudora Pro is still my POP e-mail client software of choice. / JS

Et Tu, Epson?

AFTER READING ABOUT the Epson PhotoPC for Mac camera ("Idiotproof Imaging," September '96, page 26), I called a local computer

store to inquire about the product. I was told that the PhotoPC is only for PCs. I then called Epson directly. What I discovered was annoying and somewhat contrary to what had been printed in MacUser. The PhotoPC sells at a suggested price of \$499 and comes equipped with everything you need to take and download pictures if you own a PC. If you own a Mac, however, you must pay an additional \$69 to get the Mac version of the software and the appropriate cable.

The Epson sales rep explained to me that the added cost is due to the proprietary nature of Mac hardware and because the bulk of the company's customers are PC users. This is just another case of a company treating Mac users as second-class citizens. Epson should have simply offered the PhotoPC in both a PC and a Mac version at the same price. Needless to say, I will not purchase this or any other Epson product.

Terry Spontarelli
spont@rt66.com

Starter Home (Page)

YOUR ARTICLE "Instant Home Page" (September '96, page 99) made quite an impression on me. I went from being intimidated by the whole Web thing to downloading your page in source text and then buying a Laura Lemay book and shopping for a new service provider so I can use Netscape Navigator! Thanks! (I didn't need sleep anyway.)

Thomas Cray
Groovjuice@aol.com

HyperCard's Gone Native

THE LAST TWO ISSUES of MacUser have mentioned that HyperCard 3.0 is going to be PowerPC-native, implying that HyperCard isn't already. Ever since version 2.3, HyperCard has been PowerPC-native.

Kevin Calhoun
jkc@apple.com

A Forum of One's Own

WOW! FINALLY there's an AOL forum (keyword MACUSER) that is awesome and a short artwork download. I love your magazine and editorials, especially Help Folder (which saved my Performa 405 from early execution). I look forward to getting your magazine every month, and now I can get updated info any time of the day. It's about time you guys hooked up with AOL. Keep up the good work!

S. Buckland
IrishFan10@aol.com

The difference between backing up and restoring.

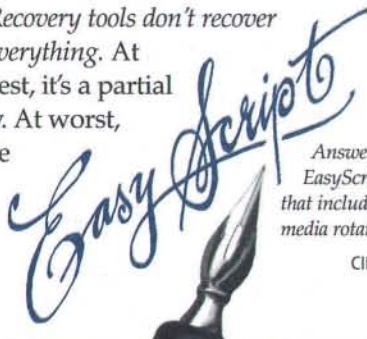
Nobody backs up just for fun. You do it for the day your hard drive goes soft and it's time to restore. That's when you see the difference between Retrospect® and the rest. Only Retrospect easily restores all your data to its former glory.

1. Beware of dragging files. If you've been "backing up" by dragging files, you'll have an unpleasant discovery when it's time to restore. Even if you've kept up to date with all your files (sure,



Think about this the next time you're "backing up" by dragging: Retrospect can scan 200 files a second to see which files have changed. Can you?

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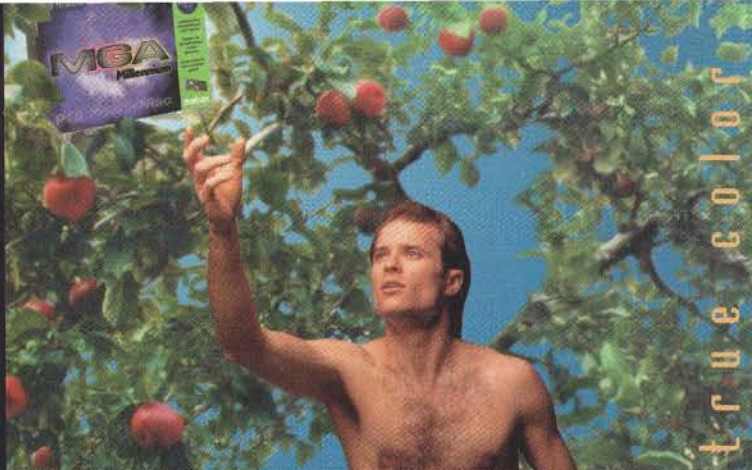
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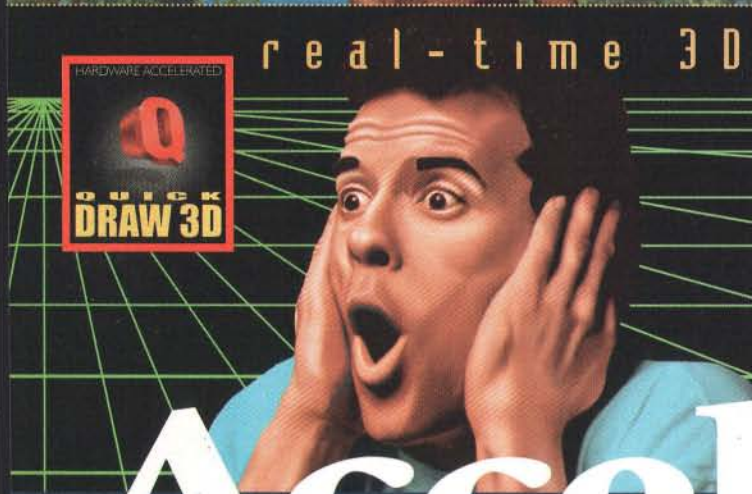
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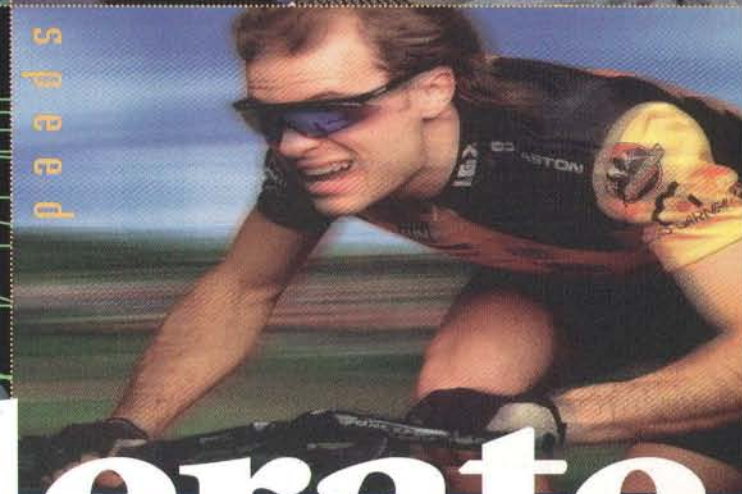
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MacBench 3.0 publishing graphics mix test performed on Power Mac 8500/132 with 40MB of RAM @ 1152 x 870 in 16.7 million colors with Matrox Millennium for PCI Power Mac, Diamond Javelin, ATI Xcelera and Radius Thunder 20/180.

CIRCLE 94 ON READER SERVICE CARD



PAMELA PFIFFNER

Dangerous Minds

I ADMIT IT: I'm a subversive. Sure, as leader of the *MacUser* pack, I do more than my share of proselytizing. Vendors who have been on the receiving end of my fervent opinions will tell you that I do so with evangelistic zeal. But that's not the only place I preach the Mac gospel. My other pulpit is the classroom. When it comes to the Mac, I'm a teacher as well as a preacher.

I teach at the Graduate School of Journalism at the University of California at Berkeley. OK, so my students aren't a bunch of cherubic apple-cheeked tots, but my class of graduate students does serve as an object lesson about what's still right with the Mac and Apple.

My class is virtually a Mac monastery, while outside these hallowed halls, the debate pitting Windows against the Mac OS rages on. The entire Graduate School of Journalism is a model of how Macs are the premier platform for producing content. Students use them for writing deadline stories, for publishing weekly newspapers, for designing magazine projects, for surfing the Net, for researching stories via the Net, for building student Web sites, and for creating special video effects in the television lab. And, of course, for drawing up that all-important job résumé. Best of all, while the "old boy" media school writes about how companies are replacing their Macs with PCs, the Graduate School of Journalism — which is training the next generation of mainstream reporters and editors — actually replaced dozens of PCs with Macs.

I teach students how to make publications, from design to layout to production on deadline. In addition to taking reporting, copyediting, and photojournalism classes, students produce weekly newspapers. Other students of mine, working in the Clay Felker Magazine Center, have created four-color magazines, one of which (*Frontera*) has made the commercial leap to the corner newsstand and at least one of which has made the transition to the Web (check out the e-zine *The Nerve!*, at <http://www.journalism.berkeley.edu>

/magazines/nerve/). Pretty cool, eh?

But I'm just as thrilled to have seen the level of Mac sophistication among my students

enhances my reputation as a technical genius.

But while I protect my little Mac sanctuary, I realize that the pressures outside the school are great. UC-Berkeley is, after all, a publicly funded institution subject to massive budget cuts. When these Macs are put to rest (it may take years), I know low-cost Wintel boxes will look appealing. At a faculty dinner to discuss new directions in cross-media instruction, I got into a spirited debate with the director of another department's multimedia lab who planned to replace its Macs with Pentium-based PCs. "Have you seen *Premiere* run on a Pentium Pro?" he asked. "It screams." I countered that it's pretty darn fast on a Mac, too, and, in fact, benchmarks show that it runs a good deal faster



on multiprocessor Macs, such as those from DayStar, than any Pentium Pro could ever dream of. And, unless he's ready to take the whole shebang to Windows NT, multiprocessing is still one Mac advantage Windows 95 can't hope to rival.

And furthermore (I was on a roll now), I asked why he would want to convert all his hardware and software to a platform that requires so much technical hand-holding, especially when it comes to video drivers? Students would focus less on creation and more on problem solving. His answer? "Because Apple's going out of business. There's no sense investing in a dead platform." Well, that's the sort of circular logic that would get a first-year graduate student booted out on his thesis.

Today's students aren't stupid. They do ask about Windows PCs. They ask if you can do desktop publishing or access the Internet on the PC, and I tell them the truth. You can, but that's not the point. The point, this subversive Berkeley professor says, is which would you rather do all those things on? Which helps you do those things faster and easier? And, let's face it, which is more fun? ☞

Because my class is for graduates, whose ages range from 22 to 40+ years, not all the students have reaped the benefits of Apple's education harvest. That's where the Mac's ease of use is a big help. A brief discourse on the Mac's menu architecture, a quick lesson on the difference between double-click and click-and-drag, and a stern polemic on the necessity of Command-Z, and the class is ready to move on to the intricacies of QuarkXPress and Adobe Photoshop.

I'm amazed at how much abuse these machines withstand. Each of the school's 100+ students boots up and shuts down several times a day. Oh yeah, these Macs do freeze — "Save, and save often, people" — so they suffer the indignity of hard restarts from panicked reporters on deadline. But even then, it's possible to troubleshoot the system without too much Sturm und Drang — which further

grows in the six years I've been teaching. In the early '90s, I'd have to start the course by familiarizing pupils with the Mac OS. Now, the vast majority of my students have been working on Macs for years — a clear payoff from Apple's efforts to seed K-12 schools.

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were only working
on Windows stuff!*



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NEWS

Apple Alters OS Plans — Again

Some improvements can't wait for Mac OS 8, so Apple will release OS upgrades twice a year.

THE LONG-AWAITED MAC OS 8, previously known as Copland, will never ship — at least not as originally conceived. Instead of releasing mega-upgrades that come in roughly three-year intervals (remember System 7?), Apple now plans to release a new system-software version every six months, each January and July.

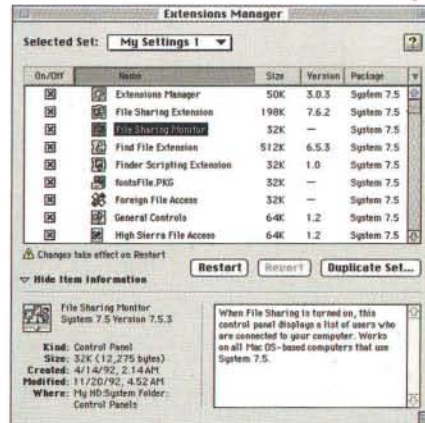
The first such release, scheduled for January 1997, is code-named Harmony. The major new feature of Harmony will be the integration of OpenDoc and Cyberdog into the Mac OS. OpenDoc is Apple's component-software architecture; Cyberdog is a suite of Internet functions based on OpenDoc (see "Walking the Cyberdog," July '96, page 69). Come January 1997, Cyberdog will be Apple's vehicle for delivering Internet capability in the OS.

This is a mixed blessing. On the plus side, Cyberdog enables users to more fully integrate the Internet with the Finder and with OpenDoc-savvy applications. For example, with Cyberdog installed, users can drag CyberItems representing URLs to the desktop and access Web sites directly by

double-clicking on the CyberItems. Cyberdog also lets users embed a Web browser or a Finder-like listing of the contents of an FTP site directly within a document.

In the minus column, Cyberdog's Web-browser features fall far short of those in Netscape Navigator and Microsoft's Internet Explorer. Apple has signed an agreement with Netscape to replace Cyberdog's current browser with an OpenDoc implementation of Netscape's browser, to be called Netscape Navigator for Cyberdog. Unfortunately, it probably won't be ready in time to include in Harmony.

The January 1997 Harmony release will deliver several other incremental improvements to 7.5.3:



One benefit of the upcoming Harmony release of the Mac OS will be a greatly improved Extensions Manager.

BETTER VIRTUAL MEMORY. Apple claims that this new version of VM will be faster and will work better with multimedia titles when they're played on low-RAM systems.

LASERWRITER 8.4. First shipped with the Apple LaserWriter 12/640 in June of this year, this new printer driver is significantly faster than previous versions and delivers many of the features of QuickDraw GX printing with-

out requiring you to install GX. It puts a printer menu in the menu bar, for example, that lets you instantly switch printers on the fly.

NEW EXTENSIONS MANAGER. Version 4.0 of Extensions Manager will give users who suffer from extension bloat new tools for managing that painful malady. The new version will provide more-detailed information about extensions — their size and location, for example — as well as more-flexible viewing choices. "Feature clustering" will make it easier to turn on and off groups of extensions that are associated with the same application.

UPDATED MULTIMEDIA CAPABILITY. Harmony will install the latest and greatest versions of QuickTime (2.5) and QuickDraw 3D (1.5).

What you should not look for in Harmony is the new 3-D desktop look or any of the Finder enhancements Apple previously promoted as features of Mac OS 8. Those will most likely appear in the July 1997 edition.

And then there are the core OS changes that are intended to lift the Mac OS into the modern era (and make it stop crashing as much as it does): preemptive multitasking, protected memory, symmetric multiprocessing, a new system-patching mechanism, a new file system, and so on. The odds in Las Vegas against any of this stuff appearing before January 1998 are running about 250 to 1.

/ HENRY BORTMAN

FUTURE TECH

Data Distinctions Due to Disappear

THERE'S NO GOOD REASON why your Mac needs one channel for accessing local storage devices (hard drives, RAID arrays) and another for accessing network devices (servers, other Macs) — no good reason, that is, except for the limitations of current technology. Storage-access channels such as SCSI are fast but are short and essentially single-purpose; network channels such as Ethernet are long-distance and multipurpose but slow.

These limitations, however, are disappearing. Storage-channel improvements such as FC-AL (fiber channel — arbitrated loop) and SSA (serial storage architecture) allow multiple storage devices and computers to hook up on common long-distance links. Technologies such as ATM (asynchronous transfer mode) and gigabit Ethernet make data-transfer rates for network channels comparable to those of storage-access channels.

As storage channels and network channels become more and more alike in their capacities and

capabilities, a new concept is emerging to describe technology that allows them to interconnect: *fabric*. *Fabric* (or *switched fabric*) is a term that was originally used to describe an intelligent switching system that connected two complex networks. Today, as network channels and storage channels converge, the term is being used to describe devices that let different channels and protocols seamlessly interconnect — or even to describe the entire interconnected system itself.

In either case, the goal of fabric technology is to handle all the media switching, protocol juggling, error checking, and other black magic needed for instantaneous, transparent access to any data from any device — no matter if that data is a Photoshop file from your departmental RAID array, a sales report from the corporate mainframe, or an e-mail message from ol' Uncle Casmir in Warsaw. The distinction between storage channels and network channels will disappear. / RIK MYSLEWSKI

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▼ **Internet Phone.** An animated assistant guides your calls over the Internet; automatic voice activation and caller ID are just two of several other functions. \$49.95. VocalTec: 201-768-9400; <http://www.vocaltec.com/>.



DigiPhone for Mac. A free extra registration pack for this Internet-phone application allows a friend to sign on. Other features include text messaging and call encryption for additional privacy. \$19.95. Third Planet Publishing: 214-713-2640; <http://www.digiphone.com/>.

iSDN Manager 4.0. The latest version of this popular ISDN-file-transfer software adds a new protocol called MLPPP (MultiLink Point to Point Protocol) that is additionally compatible with older protocols. \$2,795. 4 Sight: 800-243-0532 or 515-221-3000; <http://www.4sight.com/>.

SAM 4.5. The new version of this antivirus software includes the SafeZone, which automatically scans shareware and files while they download from the Internet. \$60; upgrade, \$30. Symantec: 800-441-7234 or 541-334-6054; <http://www.symantec.com/>.

Spell Catcher. Clean up your act with this upgrade to Thunder 7, a combination spelling checker, thesaurus, and glossary that works in all applications, including e-mail and Web browsers. \$55.95. Casady & Greene: 800-359-4920 or 408-484-9228; <http://www.casadyg.com/>.

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FIRST LOOKS

Quicken Deluxe 7.0: Friendly, Powerful Money Manager

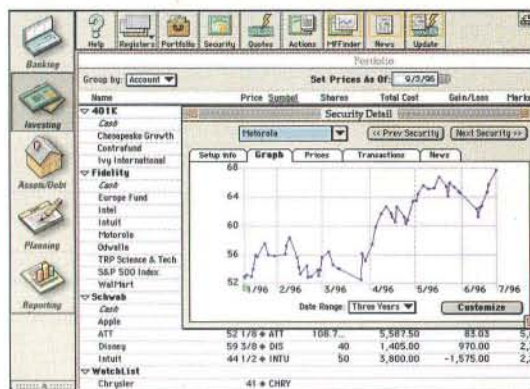
OUR FIRST LOOK at the soon-to-be-released Quicken Deluxe 7.0 shows using it to be one of the friendlier ways to help your dollars make sense. This latest version of the market-leading personal-finance application puts stronger emphasis on planning and on learning how to better manage your money. Investment tracking and online banking also get a boost, all showcased in a cleaner, more customizable interface.

A new left-hand menu bar simplifies your options by putting them into five main topics: Banking, Investing, Assets/Debt, Planning, and Reporting.

The Planning section includes a new set of snazzy, interactive Financial Fitness questionnaires that guide you through audio-explained steps analyzing your net worth, distilling your overall financial situation, and creating action plans for debt reduction and retirement planning.

Investment tracking has also received attention. The new online Investor Insight program (\$9.95 per month) lets you receive updated quotes for 500 different stocks and tracks your securities in specific lots. You can get selected financial news in addition to price updates.

Online banking gets a few tweaks, with more



Quicken Deluxe 7.0's online Investor Insight service provides details on specific securities.

financial institutions having signed on, but it's still a long way from the universal usefulness we hope for. Many items (such as the Registers) remain largely unchanged, with only a minor tweak or two.

/ BROOKE C. WHEELER

PROS: Useful new planners help you understand the Big Picture.

CONS: Online banking still limited and a bit of a hassle.

INFO: \$59.95; upgrade, \$39.95. Intuit: 800-642-8742 or 415-944-6000; <http://www.intuit.com/>

Newer Accelerates Everything

YOUR POWER MAC'S system bus — the communication channel between processor and RAM — runs at a safe and sane 40 MHz. According to Roger Kasten, Newer Technology's chief technology officer, Apple designed the bus to support clock rates of up to 60 MHz but runs it at the lower speed to ensure stability. As processor clock rates get higher, however, they're increasingly constrained by a low-speed bus. A 200-MHz processor, for example, runs five times as fast as a 40-MHz system bus; it has a bus multiple of 5.

The lower the bus multiple, the higher the performance of the entire system — and the just-released MAXpowr 180-, 200-, and 225-MHz 604e processor-upgrade cards from Newer allow you to choose a lower one. Each card can be set to one of four bus multiples, in increments of .5 — the 180-MHz card ranges from 3 to 4.5, the 200-MHz card from 3.5 to 5, and the 225-MHz card from 4 to 5.5.

If, for example, you set the 200-MHz card to a bus multiple of 3.5, your system bus will blaze along at over 57 MHz — that's over 40 percent faster than the standard 40 MHz but still within the 60-MHz maximum for which Newer claims Apple designed the bus. Not only will you enjoy the power of a faster processor but your entire system will also benefit from the faster system bus. And if your Mac balks at the high bus speed — an old, slow cache might choke, for example — simply set the MAXpowr card to a higher multiple.

MAXpowr cards are available for the Power Mac 9500, 8500, 7600, and 7500. Although the current cards also fit SuperMac clones, smaller ones designed for Power Computing systems won't ship until this winter. 180-MHz card, \$885; 200-MHz card, \$1,075. At press time, pricing was not set for the 225-MHz card. 800-678-3726 or 316-943-0222; <http://www.newer-tech.com/>. / RIK MYSLAWSKI

FreeHand 7.0:

Look Out, Illustrator, Here It Comes

IN THE COMPETITION for best illustration tool, Adobe Illustrator has generally led Macromedia FreeHand by a nose — or half a mouse. But this fall FreeHand will challenge Illustrator like never before. FreeHand 7.0 (yes, it skipped up from 5.5) answers almost every criticism brought against its predecessor, adding interface improvements, compatibility with more programs and file formats, and improved drawing features.

You'll know something's changed as soon as you see the new interface. Where once there was clutter, there are now tabbed palettes similar to those in Adobe Photoshop. Behind the scenes, an Xtras manager, similar to Apple's Extensions Manager, reins in a previously confusing jumble.

FreeHand 7.0 will offer drag-and-drop ability

PROS: Superior production tools and drawing enhancements give this program a real edge.

CONS: Some file formats aren't handled with finesse, but we found little else to criticize.

INFO: \$599; upgrade, \$149. Macromedia: 800-326-2128 or 415-252-2000; <http://www.macromedia.com/>.

with Adobe Photoshop and PageMill and will support more file formats, including GIF and JPEG. Not all formats are handled with finesse, however — FreeHand 7.0 parses foreign EPS files if you open them separately but not if you try to import them into a drawing. FreeHand 7.0 also doesn't offer an automatic mask option to preserve the shape of converted images.

FreeHand 7.0 clearly surges ahead of Illustrator in one area — production features. The enhanced Print menu lets you save style sheets for various printers — a big help for service bureaus and for those who use them. To save updating time, you can link images to external files, much as you can with a page-layout program.

On the design front, you'll be able to blend multiple objects along a path as well as search for and replace object attributes such as shape and fill. FreeHand 7.0's profoundly enhanced autotracing features will pose the first real threat to Adobe Streamline (\$199).

FreeHand 7.0 will be available separately or as part of the FreeHand Graphics Studio, which will also include new versions of xRes, Extreme 3D, and Fontographer. / SCHOLLE SAWYER



FreeHand 7.0 sports a streamlined interface and new features such as full-color autotracing, enveloping effects, and the ability to blend along a path.

IN BRIEF

Apple, Microsoft Join Forces

"A NEW ERA of cooperation" is how Marco Landi, Apple's executive VP and COO, describes a new agreement with Microsoft. The two companies are combining promotion and customer-support efforts for a pair of Power Macs — the 7600/132 and the 8200/120 — that will come bundled with Microsoft Office 4.2.1. Don't call your stateside dealer, though: This bundle will be offered only in Europe. / RIK MYSLEWSKI

Low-Cost Agfa Scanners

AGFA IMAGING EXPERTISE is now affordable. Agfa's \$389 SnapScan scans originals of up to 8.5 x 11.7 inches at a 300-x-600-ppi optical resolution and has MicroFrontier's Color It! image-editing software. The \$985 StudioStar scans originals as large as 8 x 14 inches at a 600-x-1,200-ppi optical resolution and includes Adobe Photoshop. Agfa: 800-879-2432 or 201-440-2500; <http://www.agfa.com/>. / CAROLYN BICKFORD

QuickTime VR Gets Net-Savvy

THE VIRTUAL WORLD of the World Wide Web will get a little more real this fall. Although the current QuickTime 1.0 browser plug-in lets you view QuickTime Virtual Reality scenes from within a Navigator window, version 1.1 will also enable those pannable, zoomable QTVR scenes to be image maps that link to other sites. Look for the latest at <http://qtvr.quicktime.apple.com/>. / SCHOLLE SAWYER

File-Server Speedup

FAST FILE SERVERS for fast file service — that's the promise of Apple's new Network Server 700/200 and Workgroup Server 8550/200, which both sport a 200-MHz 604e processor and beefed up RAM and storage. Network Server 700/200 prices start at \$15,000. The Workgroup Server 8550/200 (\$6,000 to \$7,500) replaces the original WGS 8550. Apple will also offer processor upgrades for current WGS 8550 and Network Server 700 users. / SHELLY BRISBIN

CLONE WATCH

Everybody's Now Aboard the Multiprocessor Bandwagon

IT'S A PERFECT late-night cable-TV ad: "Multiprocessor madness! More processors! More power!! More values!!!"

This August, Apple announced its Power Macintosh 9500/180 MP system. Only a few weeks later, Power Computing officially joined the MP club. Its PowerTower Pro 200 and 225 MP systems contain dual 200- and 225-MHz PowerPC 604e chips, respectively. Expect to find a PowerTower Pro 200 MP system with 32 MB of RAM, a 2-GB hard-disk drive, and an 8-MB IMS TwinTurbo accelerated-graphics card for around \$5,650. Similarly configured PowerTower Pro 225 MP systems

are expected to be approximately \$6,350.

DayStar Digital continues to offer the broadest range of MP systems and the only four-processor ones. Although DayStar systems aren't cheap, their prices have dropped precipitously in the last few months. DayStar's top-of-the-line Genesis MP 800+ (which has four 200-MHz 604e chips), for example, is now around \$12,000, configured with 32 MB of RAM, a 2-GB hard-disk drive, and a Radius Thunder 30/1600 graphics card.

DayStar also offers the 720+ (four 180-MHz 604e chips); the 600+ (four 150-MHz 604 chips); and the 360+ (two 180-MHz 604e chips). If you are

looking to add MP power to an existing Apple Power Macintosh or a UMAX SuperMac S900, DayStar is your only source for a dual-processor upgrade card.

Expect to see announcements soon of two additional dual-processor solutions for UMAX's SuperMac systems. For existing SuperMac S900 150-, 180-, and 200-MHz systems, UMAX will offer cards that can be installed in those systems' unique second processor slots. UMAX will also offer a dual-processor SuperMac system containing a single dual-processor card based on DayStar's nPOWER technology. / HENRY BORTMAN

NEW & NOTABLE

HARDWARE

Hewlett-Packard DeskJet 870Cse and 870Cxi. These inkjet replacements for the 850C and 855C models promise 8-ppm printing speed for black-and-white output and 4 ppm for color output. \$599 each. 800-752-0900 or 415-857-1501; <http://www.hp.com/>.

Hewlett-Packard LaserJet 6P and 6MP. These speedy replacements of the HP LaserJet 5P and 5MP deliver 8-ppm print speed and improved graphics capabilities for lower prices than their predecessors. \$800 and \$950, respectively. 800-752-0900 or 415-857-1501; <http://www.hp.com/>.

◀ **Logicode Quicktel II.** This speakerphone voice/fax modem includes convenient functions such as voice mail, Caller ID, and message forwarding to a pager or other phone numbers. \$299. Logicode Technology. 800-735-6442 or 805-383-2500; <http://www.logicode.com/>.

Tektronix Phaser 350. Get high-quality phase-change color printing for about half the cost of a color laser printer. \$3,495. 800-835-9433 or 503-682-3411; <http://www.tek.com/>.

Epson Expression 636. The appeal of Epson's new flatbed scanner is in the scanner's ability to deliver quality 36-bit-color images without destroying your bank account. A transparency adapter is optional. \$999. 800-289-3776 or 310-782-0770; <http://www.epson.com/>.

Nikon Scantouch 210. Fill preprocess, graphics-intensive scanning needs with this single-pass color flatbed scanner. A transparency adapter is optional. \$1,049. 800-526-4566 or 516-547-4200; <http://www.nikonusa.com/>.

Village Tronic MacPicasso 520. This affordable 64-bit graphics-accelerator card from Germany-based Village Tronic comes with a Cirrus Logic Alpine graphics engine and is available for PCI- and NuBus-based Macs. \$266. 510-735-6001; <http://www.phone.net/~mwm/picasso/>.

Alps MD-4000. This color printer has an integrated 600-dpi, single-pass 24-bit color scanner and comes bundled with Adobe PhotoDeluxe and Alps Copy Studio, for one-stop image processing. The printer uses Alps' newly patented Micro Dry waterproof, fade-proof inks. \$699. Alps Electric USA. 800-825-2577 or 408-432-6000; <http://www.alpsusa.com/>.

Mitsubishi Diamond Pro 91TXM. This 21-inch DiamondTron monitor has an improved aperture-grille frame and beam-gun design for a crisper, brighter picture. \$1,699. 800-843-2515 or 714-220-2500; <http://www.mitsubishi-display.com/>. / BROOKE C. WHEELER



Imaging Avalanche

A batch of new digital cameras announced by Nikon, Sony, Olympus, and Canon round out a year of innovation.

WE'LL REMEMBER 1996 as the year in which every major camera maker joined the digital revolution — and when the more ingenious of them created units that were more than mere digital replicas of their film-based forebears.

NIKON COOLPIX 300 ▶.

Easily the most innovative digital camera we've seen is the Nikon CoolPix 300, which should cost around \$1,000 when it's released early next year. Its color LCD panel displays images and serves as the interface to a pen-based operating system. Handwritten and audio notes can be linked to an image, and up to 125 640-x-480-pixel images can be downloaded to your Mac or displayed on a TV.

◀ **NIKON COOLPIX 100.** Sharing the same high-quality optics, autoexposure features, and auto built-in flash as the CoolPix 300, the tiny CoolPix 100 slips out of its battery pack and into your PowerBook's PC Card slot to download its forty 512-x-480-pixel images. Expect it to cost around \$500. 800-645-6872 or 516-547-4200; <http://www.nikonusa.com/>.

SONY DSC-F1 ▶. The \$849 Sony DSC-F1, which comes with a flash and an LCD view panel, can record up to four 640-x-480-pixel images per second or can



split an image into nine segments, the segments captured 1/30 second apart. Too bad the Mac can't take advantage of its high-speed IrDA infrared interface, as some PCs can. 800-352-7669 or 408-432-1600; <http://www.sony.com/image>.

OLYMPUS D-200L. At around \$500, the Olympus D-200L couples point-and-shoot simplicity with an LCD view panel, a built-in flash, and a bundled copy of Adobe PhotoDeluxe. Eighty 640-x-480-pixel images can be downloaded to your Macintosh through the included serial cable.

OLYMPUS D-300L ▼. The D-200L's big brother, the under-\$900 D-300L, shares the identical LCD-panel and flash design, but it is able to capture 120 images at 1,024 x 768 pixels, the highest resolution in its class. 516-844-5000; <http://www.olympusamerica.com/>.

CANON POWERSHOT 600 ▼. The autofocus, autoflash Canon PowerShot 600 stores 18 832-x-608-pixel images in its built-in RAM, but it also accepts Type I, II, and III PC Cards — a 170-MB Type III card can hold 3,000 images. Canon says a Mac-compatible PowerShot 600 will be appearing "soon." 800-848-4123 or 714-438-7100; <http://www.ccsi.canon.com/>.

/ RIK MYSLAWSKI



Java Now Easier to Brew

PROGRAMMERS AND WEB developers tired of peering into the murky depths of most current Java development environments will get an eyeful from Symantec's Visual Cafe. And if it takes more than a cup of coffee to get you going in the morning, you can always start your day with a quick shot of the latest version of Metrowerks' CodeWarrior.

Visual Cafe (\$199) is a Java-only RAD (Rapid Application Development) environment with graphical tools such as a GUI (Graphical User Interface) builder, a Component Library, and an Interaction Wizard. Developers can build applications using visual tools; Java code is generated

automatically. Visual Cafe differs from Symantec's previous Java tool, Cafe, in that the development interface of the former is completely graphical and forms-based. Upgrades from Cafe are \$99. 800-441-7234 or 541-334-6054; <http://www.symantec.com/>.

Metrowerks has added a graphical class browser to CodeWarrior, the firm's development environment, and now includes a Java-applet construction tool as well. This new version, CodeWarrior 10, also adds development tools for General Magic's MagicCap. 800-377-5416 or 512-873-4700; <http://www.metrowerks.com/>. / SHELLY BRISBIN

NET.CETERA

Fly Through the Web

Apple's HotSauce: A whole new way to navigate the Web.

BROWSING THROUGH WEB SITES — even well-designed ones — can be a mouse-click marathon. Click on a link, click on the Back button, click on *another* link, click on the Back button, ad infinitum. Apple is trying to relieve the tedium with what it hopes is an easier way to navigate the World Wide Web: HotSauce.

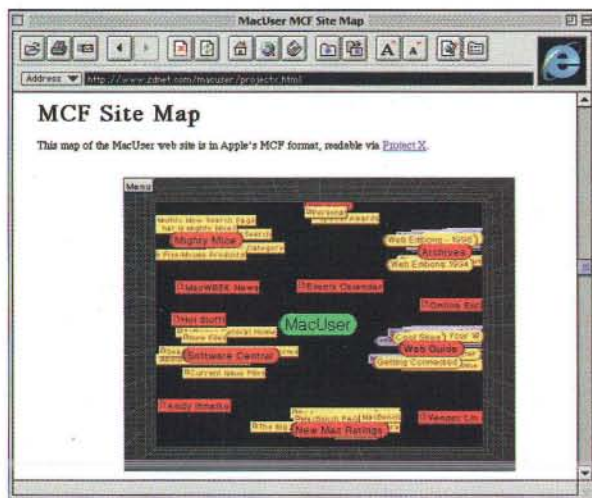
You read that right. HotSauce. Must be some stiff competition within Apple's Department of Funny Names: The genius who thought up *Cyberdog* is still the reigning champ — but barely.

Formerly known as Project X and heavily promoted by Apple at every opportunity, the HotSauce browser plug-in (available both for the Mac OS and for Windows at <http://hotsauce.apple.com/>) lets a Web page include an embedded *X space* that you can fly through. Each X space graphically displays a hierarchy of information, so you can float around on the surface or tunnel deep into any area that strikes your fancy.

Since you can see an entire Web site at one glance (none of that click-back-click stuff), HotSauce can be a useful navigation tool once — or *if* — you get used to it. You may find that you just don't like how HotSauce represents a Web site's contents. Aesthetically speaking, it's rather crude, and navigating to distant links can be tedious and time-consuming.

There's more to HotSauce, however, than fancy information fly-throughs: Underlying it is the Apple-created Meta-Content Format, or MCF, a text-

based code that describes how various items relate to one another. Apple hopes that MCF will become a standard — on the Internet and off — for describing how elements in information collections relate to one another. Using HotSauce is only one way of showing those relationships. Just as Web browsers can render HTML pages in various ways, so too can MCF viewers display relationships. In addition to its distinctive 3-D view, for example, HotSauce also offers a familiar Finder-style outline view.



The HotSauce plug-in, available for both the Mac OS and Windows, lets users fly through *X spaces* from within their browser.

The Geek Beat

INTERNET HARDWARE. It's a Web server, it's a DNS, it's a router — it's the InterJet, from Whistle Communications. With a UNIX-based computer at its core, modem or ISDN connections to an ISP, and Ethernet for LAN access, the InterJet is an Internet server designed for small businesses. It includes support for POP mail, Web access, and publishing and is managed through a Web-based interface.



Customers must purchase the InterJet and Net access from an ISP for \$1,995 (Netcom and PSI were the first to sign up with Whistle). 888-494-4785 or 415-577-7000; <http://www.whistle.com/>.

INTERNET SOFTWARE. LiveCard is a CGI application that allows you to serve HyperCard stacks via the Web. Web surfers need no browser plug-ins, and stacks can be served to Mac OS, Windows, or UNIX users. \$149. Royal Software: 800-888-7667 or 813-581-6422; <http://www.royalsoftware.com/livecard.html>. WebDBC is a development tool and gateway for Webmasters who want to connect their sites to ODBC databases. The development software is free on the Web; the gateway product sells for \$595. Nomad: 206-812-0177; <http://www.ndev.com/>. ClearWay Technologies' FireSite (\$499) accelerates access for sites served by 28.8-kbps modem lines. The WebStar-compatible plug-in uploads GIF and JPEG images to an ISP-based Web server, taking advantage of the ISP's faster connection to the Internet. 888-552-5327 or 617-973-5001; <http://www.clearway.com/>.

New Design Standard for Web and Print Publishing

IT'S THE CURRENT CONUNDRUM in the publishing field: How can you make documents that are destined for print available for the World Wide Web in a format that takes advantage of all the bells and whistles the medium has to offer? Converters for existing publications are limited, and starting from scratch requires too much time — and too much HTML coding. What if you could design content for both the printed page and the Web and have it automatically prepare itself for its destination on the fly? That's the promise of NuDoc, a new page-description technology from Archetype, a

provider of database tools for publishers.

NuDoc is a flexible, object-oriented technology that lets you create content independent of that content's final destination. Tags embedded within the content specify media type (text, pictures, movies) and output format (PostScript for print, HTML for the Web). When you want to publish the content, the NuDoc imaging engine reads the tags and pours the content into the appropriate *container*, as Archetype calls the document templates. Archetype has licensed Bitstream's TrueDoc technology to handle typographic conversions.

Publishers design the container with Archetype's PageFlex application, slated for release by mid-1997. PageFlex will let you preview the document before output and can contain links to databases holding frequently updated information. Archetype says NuDoc plug-ins for Netscape Navigator will soon be available, allowing publishers to edit content in the browser.

Both Apple and publishing integrator SII plan to adopt NuDoc. Archetype promises to publish the specifications for making NuDoc containers before the new year. 617-299-6650. / PAMELA PFIFFNER

NEW & NOTABLE

RESOURCES

PM-to-QX Xtension. This handy utility can convert Adobe PageMaker files into QuarkXPress files while retaining the originals' layout and attributes. Really. \$99. Markzware: 800-300-3532 or 714-756-5100; <http://www.markzware.com/>.

▼ **The Grammar of Ornament, Professional Artists' Edition.** This CD-ROM, based on an 1856 book commissioned by the British government to ensure design quality during the Industrial Revolution, contains more than 2,300 pattern designs from 20 different regions and cultures, including Egypt, Assyria, China, Turkey, and

Renaissance Europe. \$199. Direct Imagination: 818-793-8387; <http://www.dimagin.com/>.

ReelTextures. Add animated backgrounds to video projects with this CD-ROM collection of 40 broadcast-quality QuickTime clips, mattes, wipes, and stills. \$349. Artbeats:

800-444-9392 or 541-863-4429; <http://www.artbeats.com/>.

web.STIR Artkit. Choose from 500 images, icons, backgrounds, dividers, buttons, and bullets in this CD-ROM library of 8-bit clip art for the Web. The files are ready to drag right into your HTML editor. \$150. Letraset: 800-526-9073 or 201-845-6100; <http://www.letraset.com/>.

WildRiverSSK. A suite of seven Photoshop filters and plug-ins lets you simulate 3-D effects; create multicolor frames; and add effects such as textures, backlighting, shadows, and TV static to Photoshop images. \$99.95. DataStream: 606-255-6686; <http://www.datastream.com/>.

GymnastXT. This cross-platform plug-in translates Adobe Acrobat PDF files from the Mac OS, Windows, and UNIX into EPS files for importing into QuarkXPress. \$99.95. DataStream: 606-255-6686; <http://www.datastream.com/>.

FutureSplash Animator. FutureWave's popular SmartSketch drawing technology is integrated into this package that lets you create vector-based cartoons, logos, images, buttons, and streaming animations for the Web. \$250. FutureWave: 800-619-6193 or 619-552-7680; <http://www.futurewave.com/>.

ClearVideo. Compress video content to one-fifth its original file size and data rates to as low as 10 kbps, with smoother results than you'd get with other compression applications. Fine-tune frame size and rate and target data rate, and ClearVideo does the rest. \$995. Iterated Systems: 800-437-2285 or 404-264-8000; <http://www.iterated.com/>. / BROOKE C. WHEELER

Mac Business Boom

A flock of new business software arrives.

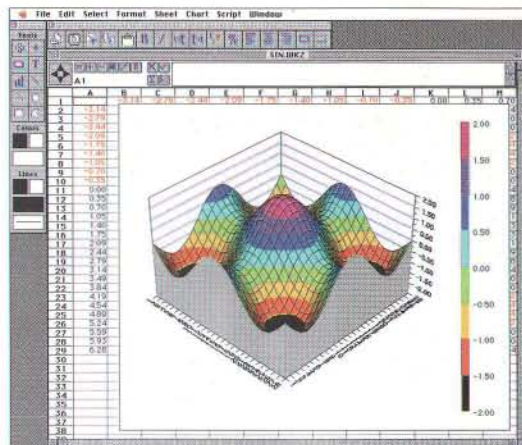
PUBLISHING, VIDEO, and Internet applications may hog the headlines, but Mac software developers are boldly marching into a battleground long thought lost to the Wintel hoards: business. Witness, for example, the reappearance of Wingz, the power user's spreadsheet program, as well as the arrival of several other innovative or revamped business applications.

WINGZ 2.1 ▶. Often admired for its powerful built-in scripting, its excellent 3-D charts, and — admittedly — the fact that it wasn't Microsoft Excel, Wingz now has an interface that includes a floating toolbox and redesigned menus, the ability to manipulate chart objects directly on a worksheet, and support for over 400 new HyperScript commands and functions. Wingz 2.1's parent, Investment Intelligence Systems, also offers a utility that lets you tie Wingz into a SQL database. A Wingz update planned for early next year will add more graph styles, support for Excel macros, and the ability to display a Wingz worksheet over the Web. \$399. 800-494-9464 or 913-663-4472; <http://www.wingz.com/>.

CONNECTED 3.0. EveryWare's industrial-strength accounting program, Connected 3.0, now lets you customize its forms, set up recurring invoices, and create POs from sales orders automatically. Single-user, \$895; multiuser, \$1,795. 905-819-1173; <http://www.everyware.com/>.

OMNIFORM. Caere's OmniForm for Macintosh database software has an OCR engine that reads your business forms' design elements and converts them into data-entry fields, tables, and borders. \$349. 800-543-0334 or 408-395-7000; <http://www.caere.com/>.

WATCH IT! Hi Resolution's Watch It! extension unobtrusively monitors how long you or (if you're on a network) people in your workgroup are



actively working on each project. \$99. 800-455-0888 or 508-543-6955.

POST-ON-THE-FLY CONFERENCE. Corporate collaboration could take an Internet turn with HomeCom Communications' Post-on-the-Fly Conference, which lets colleagues and customers use the Internet to upload audio, video, graphics, and word-processor documents into electronic-conference groups. Post-on-the-Fly Conference will be available for the Mac early next year. No price has been set. 404-237-4646; <http://www.homecom.com/>.

OFFICEMATE. If you just need a few business-document templates to get you started, you can try out SoftKey's OfficeMate, a collection of over 500 customizable Microsoft Word and Excel templates for invoices, expense reports, 401K planners, and more. \$30. 510-792-2101.

MODEL BUSINESS LETTERS. If 500 document templates aren't enough for you, there are 575 more in ModelOffice's Model Business Letters, which includes sample apologies, announcements, and cover letters. \$39.95. 800-801-3880 or 512-302-3888. / CAROLYN BICKFORD



THE OFF BEAT

Twist and Shout

DO THE TWIST with this futuristic — and enormous — color monitor. Abandon the tedium of scrolling through documents: Just take hold of the steering-wheel-like handle of this 20-inch monitor and twist it to landscape or portrait mode for a complete view of even tabloid-sized pages. Not only does this monitor perform its switcheroo on the fly but it can also accommodate 24-bit, 1,600-x-1,200-dpi video. In line with monitors of similar size and quality, it's priced near \$3,000 — but you'll have to wait until the spring of 1997 to be the first on your block to have one. Portrait Displays: 800-858-7744 or 510-227-2700; <http://www.portrait.com/>. / NANCY PETERSON

PIManiacs, Rejoice!

Personal organizers now provide a smile with your schedule.

FLAMING TRASH CANS, wacky patterns, and useful features distinguish these five revamped PIMs.

CLARIS ORGANIZER 2.0. The new built-in patterns in Claris Organizer 2.0 include sober as well as zany designs — even a caveman motif. More seriously, it has several innovations, such as the ability to search for a contact by using only initials and to launch a word processor or e-mail program from within a contact's record. \$69. 800-544-8554 or 408-987-7000; <http://www.claris.com/>.

LOTUS ORGANIZER. The group scheduler Lotus Organizer will finally be available for the Mac this coming January. Among its notable features are three levels of password protection; integration with Lotus' cc:Mail LAN-mail system; and the

ability to accept, decline, or delegate appointments. It also has an amusing trash can that incinerates items. About \$80. 800-343-5414 or 617-577-8500.

FRANKLIN QUEST ASCEND 4.0. Based on the hard-copy Franklin Quest Day Planner, Ascend 4.0 is gaining on its more sophisticated electronic competition. It can link tasks and appointments to contacts and has a multiday view that can show seven weeks of appointments, tasks, and notes. Franklin Quest claims Ascend is the only PIM that can print its records in every size and style of the Franklin Day Planner system. \$99.95. 801-975-1776.

DAY-TIMER ORGANIZER 2.1. Like Franklin Quest Ascend 4.0, Day-Timer Organizer 2.1 is descended from a binder-based system and is also improved. It can now automatically fill in a record after you type the first few letters; it supports mail-merge with ClarisWorks and Microsoft Word, and it totals time and expenses for you. \$59.95. 415-572-6260.

DATEVIEW 2.6. Although the Prairie Group acquired DateView well over a year ago, version 2.6 can boast only modest improvements — such as better reliability and improved integration with its address-book counterpart, InTouch. \$49.95; bundled with InTouch, \$79.95. 800-346-5392 or 515-225-3720; <http://members.aol.com/prairiesft/index.html>. /CAROLYN BICKFORD



Fun backgrounds and innovative features mark Claris Organizer 2.0.

CD-ROMS

From Silver Screen to Silver Disc

WHEN THE RENT'S DUE and the residual checks are late, today's out-of-work actors make ends meet with a quickie CD-ROM gig.

KIYOKO AND THE LOST NIGHT. Academy Award winner Ben Kingsley had enough clout to land a respectable role as the English-language narrator of this charming story, set long ago and far away in the Amazon rain forest. You can hear and read it in French, German, Italian, and Spanish. \$29.95. Ubi Soft Entertainment: 800-454-9356 or 415-547-5000; <http://www.ubisoft.com/>.

TREASURE QUEST. *Star Trek: Deep Space Nine's* Terry Farrel seems to be merely running through old drama-class exercises as she portrays the ghost of a murdered woman who apparently communicates by impersonating an assortment of stock-

character stereotypes. You have a chance to win \$1,000,000 if you solve this so-called mystery, but it would help if the mystery were entertaining and not just pretentiously cryptic. \$50. Sirius Publishing: 602-951-3288; <http://www.treasurequest.com/>.

NINE WORLDS ▶. *Star Trek: The Next Generation* may be off the air, but Patrick Stewart is still cashing in on the final-frontier shtick. Here he leads you through highlights of astronomy, the solar system, and a fun — if somewhat silly — travel section that includes, for instance, info on how much you'd weigh on another planet. You can continue learning on your own with an excellent resource section that includes Internet links to a myriad of astronomy Web

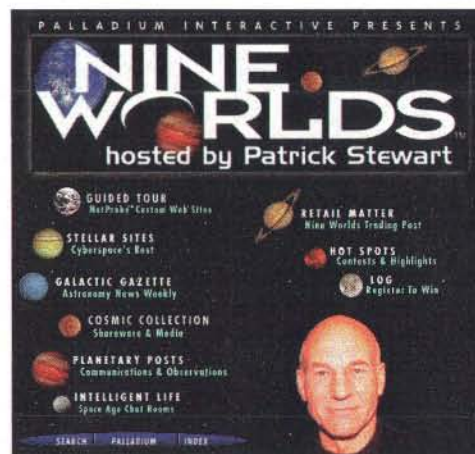
MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of September 2, 1996. Prices (other than those for compact models, Performas, and LCs) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

MAC MODEL	NEW	USED
Classic II (4/40)	•	\$225
LC III (4/80)	•	\$250
Performa 5215CD (8/1GB)	•	\$1,100
Performa 6220CD (16/1GB)	•	\$1,200
Ilisi (5/80)	•	\$200
Ilci (4/80)	•	\$275
Ilfx (4/80)	•	\$375
Quadra 610 (8/160)	•	\$450
Quadra 630 (4/250)	•	\$475
Quadra 650 (8/230)	•	\$550
Quadra 800 (8/230)	•	\$800
Quadra 8400v (8/230/CD)	•	\$1,000
Quadra 950 (8/230)	•	\$900
Power Mac 6100/66 (8/350/CD)	•	\$625
Power Mac 7100/80 (8/700/CD)	•	\$900
Power Mac 7200/90 (8/500/CD)	•	\$1,150
Power Mac 7500/100 (16/1GB/CD)	•	\$1,950
Power Mac 8100/100 (16/1GB/CD)	•	\$1,500
Power Mac 8500/120 (16/2GB/CD)	•	\$2,450
Power Mac 9500/132 (16/2GB)	•	\$2,700
PowerBook 180 (4/120)	•	\$750
PowerBook 190cs/66 (8/500)	•	\$1,025
PowerBook 520c (4/160)	•	\$1,100
PowerBook 540c (4/320)	•	\$1,200
PowerBook 5300cs (8/500)	•	\$1,600
Duo 250 (4/200)	•	\$675
Duo 280c (4/320)	•	\$1,300
Duo 2300c/100 (8/750)	\$2,499	\$1,850
Power Computing Power 100 (16/1GB/CD)	•	\$975
Power Computing PowerWave 604/150 CD (8/1GB)	•	\$2,300

• = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 770-955-0569 or visit <http://www.uce.com/>. And find it on ZD Net, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER).



pages, astronomy shareware, and contact information for astronomy clubs. \$39.95. Palladium Interactive: 800-910-2696 or 415-464-5500; <http://www.palladiumnet.com/>. /CAROLYN BICKFORD

ONLINE

HEARD ON THE NET

"I am convinced that if General Motors could eliminate [Microsoft] Office from their entire company, they could get the 1999 cars out next year at half price."

— Sun Microsystems' CEO, Scott McNealy, on The Site (http://www.thesite.com/0796w3/work/mcnealy_tr.html)

Apple Achin' Spring

SO WHAT IF *Copland* has been ditched as System 8's official moniker and there won't even be a System 8 as we know it? That doesn't mean your Macintosh has to remain stuck in System 7 until that far-off day when Macintosh OS 8 finally arrives in some form. Here's some shareware that can make your desktop look like you're running System 8, complete with 3-D icons, built-in window shades, and more:



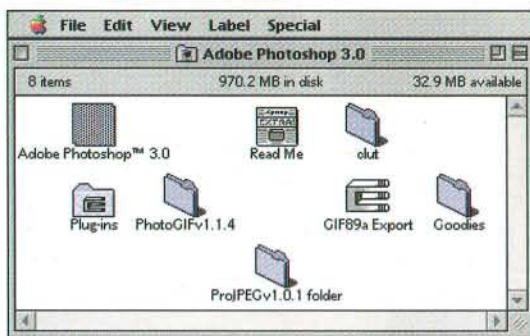
There's only one **Aaron** ▶

(**\$\$\$**). Greg Landweber's and Edward Voas' legendary \$10 system extension replaces your system font, modifies menu bars, changes system icons, and much more. Simply drag the Aaron extension into your Extensions folder, and restart. You'll be amazed at how complete the change in appearance can be.

If the Copland look doesn't fit your style, check out Landweber's **BeView** (**\$\$\$**), which makes the Mac OS look like the Be OS.



For those who insist on having matching custom icons and interfaces, Erik Selke's free **Virtual Copland** (**\$\$\$**) is a suite of AppleScript applets that automatically



replaces system icons with Copland-style ones. There's also a great full-color startup screen and replacements for over 100 icon styles.



Although not for the timid (we found that it sometimes caused Macs to behave strangely), Chris Thomas' **MenuTasking Enabler** (**\$\$\$**) hacks System 7 to perform at least one behavior promised for OS 8. Once you've installed this utility, your Mac no longer grinds to a halt when you pull down a menu; instead, it speeds along as if your mouse button had never been clicked. / JODI NAAS

MACUSER UTILITY OF THE MONTH

Deinstall Your Files with Ease

DO YOU EVER HESITATE before installing a new software package, worried that if you decide to get rid of it later, you'll never be able to find all the files scattered throughout your System Folder?

Now you'll worry no more, thanks to *MacUser's* Install Tracker. When you drag installer applications onto Install Tracker's icon, the utility carefully watches where every file is placed. When you want to remove the software

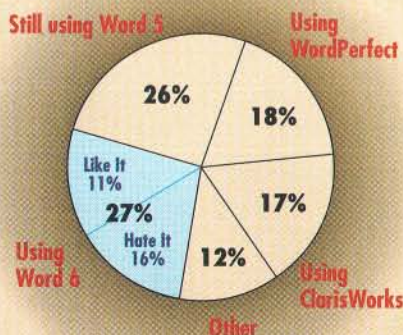
from your hard disk, Install Tracker lists all the installed files and lets you move them to the Trash with just one button click.

Install Tracker was written by Mark Batten and will be available beginning October 30 from *MacUser's* homes on CompuServe (GO ZMC:MACUSER), on the Web (<http://www.zdnet.com/macuser/software/>), and on America Online (keyword MACUSER).



ONLINE POLL

Q. After all the controversy over Word 6, what word processor are you using? If you're using Word, how do you feel about it?



To participate in *MacUser's* online polls, go to <http://www.zdnet.com/macuser/poll.html>.

MACUSER ONLINE-EVENT CALENDAR

DATE	TIME	EVENT
November 7	9 P.M. EST	The Web: <i>MacUser's</i> online editors
November 14	10 P.M. EST	Hot Mac Games: Roman Loyola
November 19	9 P.M. EST	New PowerBooks: Andrew Gore
November 25	9 P.M. EST	Help Folder: Mac advice with Bob and Chris

All events will take place on America Online. Times and guests are subject to change. For up-to-date event information and locations, check out keyword MACUSER or <http://www.zdnet.com/zdi/talk/talkcal.html>.

MACUSER ONLINE

Web: <http://www.macuser.com>

AOL: keyword MACUSER

CompuServe: GO

ZMC:MACUSER

Send letters to the editor to letters@macuser.com.

To subscribe to the *MacUser* Web bulletin, e-mail macuserweb@macuser.com, using the subject *subscribe*.

Now
Software

It's about time.

What kind of person can get Hootie & The Blowfish, Tori Amos, *and* Collective Soul on his calendar?

You. And no recording industry experience required. Announcing Now Up-to-Date™, the only schedule and contact manager that brings you the world of the Web.

Take off to sites like Atlantic Records. With a single drag and drop, you can add your favorite artist's concert dates, even a whole group of them, to your calendar. Find Tori Amos' tour date for your home town and simply drag it



for the
Web

a hot link back to
the Atlantic site.
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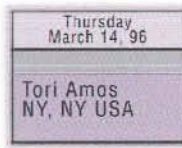


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REVIEWS

Motorola Mac OS Clones

StarMax 3000/160 DT ★★★★★

StarMax 3000/200 MT ★★★★★

StarMax 4000/160 DT ★★★★★¹/₂

StarMax 4000/200 MT ★★★★★¹/₂

Motorola's solid new line of Mac OS clones takes aim at the dwindling corporate-Mac market.



WELCOME ABOARD, MOTOROLA.

Lining up alongside Power Computing, UMAX, and DayStar Digital, the multibillion-dollar electronics giant has become the latest — and largest — initiate in the elite club of Mac OS system vendors and the first with the manufacturing and marketing muscle to extend the reach of the Mac OS into large corporate sites and international accounts.

Motorola offers eight StarMax systems, divided into two lines. StarMax 3000s are based on the PowerPC 603e processor. StarMax 4000s are based on the higher-end PowerPC 604e processor. In each line, you can choose between a 160-MHz and a 200-MHz processor and between a desktop and a minitower design. Desktop systems have three PCI slots; minitower designs have five, plus more room than the desktop systems for internal drive expansion.

All eight StarMax systems are built around the same logic board, a design known as Tanzania, developed jointly with Apple and including some interesting features not seen before. In addition to having a standard Mac ADB port, for example, the back panel of a Tanzania system is also graced with PS/2 mouse and keyboard ports. Yes, we tried them.

Yes, they worked. And, no, there's no driver provided for the second mouse button on a dual-button mouse. What happens if you press the right button? Nothing.

Also intriguing: StarMax logic boards don't contain Mac monitor ports, only SVGA ports. They worked fine, too, after we scrambled around for some SVGA-to-Mac video adapters. Motorola won't be providing these inexpensive adapters with StarMax systems — a penny-wise, pound-foolish decision. The other ports are more Mac-like: 16-bit stereo-in and -out, SCSI, and dual serial — but you won't find an Ethernet port on any model.

Another disappointment is that all StarMax systems have their processors soldered to their logic boards. If you're looking to upgrade your processor down the road — as is possible with most Mac OS systems these days — you won't want a StarMax. StarMax 3000- and 4000-series machines also contain only three DIMM sockets, so RAM upgradability is limited. And, as you might have guessed from the odd number of sockets, RAM isn't interleaved.

All StarMax systems come with an 8x IDE (it's

actually an ATAPI) CD-ROM drive, a keyboard, and a mouse. Monitors are not included. All systems also have a five-year warranty, by far the best standard warranty of any Mac OS system on the market. (Apple and Power both offer standard one-year warranties; if you want to extend a warranty, you'll have to fork over extra bucks.)

StarMax desktop models (identifiable by a DT at the end of their names) come with 16 MB of RAM and a 1.2-GB IDE hard drive. Minitower models (which sport an MT suffix) come with 32 MB of RAM and a 2.5-GB IDE hard drive.

Series-4000 systems include a 256K L2 cache and 2 MB of built-in graphics RAM. Series-3000 systems include a 256K L2 cache and 1 MB of built-in graphics RAM, which, like that of the Series-4000 systems, is upgradable to 4 MB. Series-3000 models also

come with a 28.8-kbps Motorola data/fax modem and a software bundle that stands up quite well against Apple's and Power Computing's bundles.

Included in the 3000-series software bundle are the latest versions of



REVIEWS RATING KEY



OUTSTANDING



VERY GOOD



ACCEPTABLE



POOR



SERIOUSLY FLAWED



DAINGEROUS



THE NEWEST CLONES / Motorola's StarMax systems stack up well against the competition

Motorola has entered the Mac-clone fray with a line of systems based on the company's own PowerPC 603e and 604e processors. MacUser Labs performed our MacBench 3.0 suite of benchmark tests on Motorola's offerings and discovered that they perform comparably to similar systems from Apple and Power Computing. Systems were configured as detailed at the end of this review.

All MacBench 3.0 scores are relative to those of an Apple Power Macintosh 6100/60 (with a 250-MB Quantum internal hard-disk drive and with built-in

graphics hardware), which is assigned a score of 10.0 in each test.

Because StarMax systems contain ATAPI 8x CD-ROM drives (ATAPI is a derivative of IDE), which have never before been used in Mac OS systems, we were unable to perform MacBench's CD-ROM Mix test, which was designed for use with SCSI drives.

Download a copy of MacBench from <http://www.zdnet.com/zdbop/> or from ZD Net/CompuServe Edition (GO ZDBENCH). Or, for a CD-ROM, send \$5 (for shipping and handling) to ZDBOP, 1001 Aviation Pkwy., Ste. 400, Morrisville, NC 27560.

MACBENCH 3.0 SCORES

	Processor	Floating Point	Disk Mix	Publishing Disk Mix	Graphics Mix	Publishing Graphics Mix
Motorola StarMax 3000/160 DT	27	26	18	14	30	23
Apple Performa 6400/180	19	24	20	15	14	11
Power PowerBase 180	29	29	17	15	36	28
Motorola StarMax 3000/200 MT	30	31	21	16	37	27
Apple Performa 6400/200	27	31	25	16	19	15
Power PowerBase 200	30	31	17	15	37	29
Motorola StarMax 4000/160 DT	31	35	19	15	38	28
Apple Power Mac 8500/150	27	30	27	18	29	25
Power PowerTower 180e	45	40	33	17	*	*
Motorola StarMax 4000/200 MT	35	43	22	16	49	35
Apple Power Mac 9500/200	41	44	25	17	67	49
Power PowerTower 200e	47	44	32	17	*	*
	SCORE	BETTER	SCORE	BETTER	SCORE	BETTER

*Data for the Power Computing PowerTower 180e and 200e were unavailable.

ClarisWorks, Now Contact and Up-to-Date, Quicken, Netscape Navigator, AOL software, Conflict Catcher, SAM, DiskFit Direct, Norton Utilities, FWB's HD ToolKit and CD-ROM ToolKit, and several CD-ROM titles.

But enough of this specsmaniship. You wanna know how fast they are, right? So did we, and to find out, we ran our industry-standard benchmark suite, MacBench 3.0, on four of Motorola's StarMax systems: the 3000/160 DT, the 3000/200 MT, the 4000/160 DT, and the 4000/200 MT.

Although the StarMax 3000/160 DT's processor clocks 20 MHz slower than that of the Power Computing PowerBase 180, the 3000/160 DT's speed is off by only about 7 percent in the Processor test. Both systems leave Apple's Performa 6400/180, which ships without an L2 cache, in the dust. The PowerBase 180 has more graphics RAM and turns in significantly better graphics speed than the Performa 6400/180 and noticeably better speed than the StarMax 3000/160 DT.

In other Processor results, we see a similar photo-finish race between Motorola's StarMax 3000/200 MT and the minitower model of Power's PowerBase 200, with Apple's Performa 6400/200 again back in the pack. The main advantage of the StarMax 3000/200 MT over the PowerBase 200 is that the former has just over twice the hard-drive capacity and turns in a significantly better Disk Mix score.

The StarMax 4000/160 DT doesn't hold up quite as well against its nearest Power

Computing competitor, the PowerTower 180e. Although the PowerTower's 604e processor clocks only 20 MHz faster than the 4000/160 DT's processor, the PowerTower runs circles around the 4000/160 DT in the Processor test — a result of the difference in logic-board design and the larger (1 MB) cache in the PowerTower 180e. The 4000/160 DT also turns in unimpressive Disk Mix results.

Apple's closest competitor to the StarMax 4000/160 DT, the Power Mac 8500/150, is quite a different beast. Its main claim to fame is its built-in digital-video capability. But it also costs a cool kilobuck more than the 4000/160 DT — there are several good digital-video cards that can be had for less.

What's intriguing about the 4000/160 DT is that, pricewise (\$2,595, or \$700 less than the PowerTower 180e), it's in a class by itself among systems containing PowerPC 604e processors. But it comes bundled with no software other than the operating system, and despite its low cost for a 604e-based system, you can get a StarMax 3000/200 MT that performs nearly as well for \$200 less.

Moto's top-of-the-line StarMax 4000/200 MT undersells Power's PowerTower 200e by only about \$150. But the performance penalty you pay for the modest price differential isn't worth the savings. Power's system is a full one-third faster than Motorola's on the MacBench Processor test. The PowerTower 200e outperforms the StarMax 4000/200 MT on our Disk Mix tests as well.

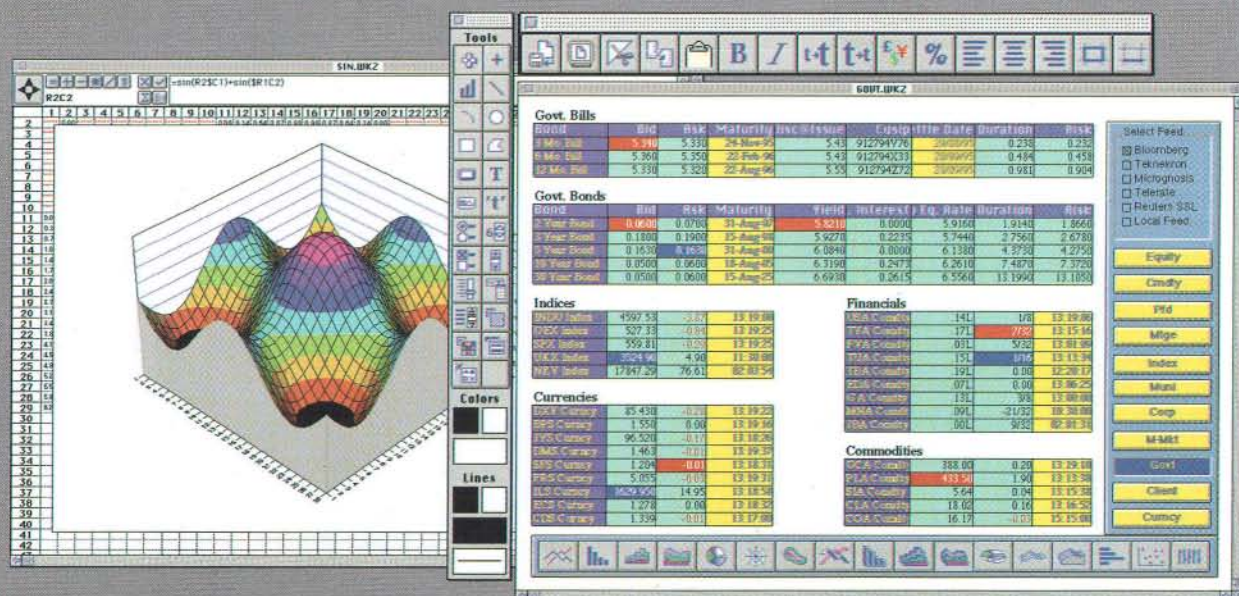
The Bottom Line

Comparing its offerings to those of Apple, Motorola has a compelling story to tell. Its systems, in general, turn in solid performance and offer a price advantage over Apple's Power Macintosh and Performa lines. Compared to Power Computing's offerings, StarMax systems look a bit paler. However, at corporate sites, an established track record such as Motorola's — backed by a five-year warranty — counts as much as a price or performance advantage.

IS Managers are likely to turn a blind eye, however, toward systems with truncated upgrade paths. Omitting a processor-upgrade slot may be Motorola's single biggest mistake with its first round of StarMax systems. Fortunately, the company is considering a solution to this problem: Future incarnations of the StarMax line may contain a BGA (ball grid array) processor socket, similar to those found in Windows systems. Let's hope this improvement comes soon. / Henry Bortman

Motorola StarMax 3000/160 DT with 16 MB of RAM, 1.2-GB hard drive, 256K L2 cache, and 1 MB of graphics RAM, \$1,595; **Motorola StarMax 3000/200 MT** with 32 MB of RAM, 2.5-GB hard drive, 256K L2 cache, and 1 MB of graphics RAM, \$2,395; **Motorola StarMax 4000/160 DT** with 16 MB of RAM, 1.2-GB hard drive, 256K L2 cache, and 2 MB of graphics RAM, \$2,595; **Motorola StarMax 4000/200 MT** with 32 MB of RAM, 2.5-GB hard drive, 256K L2 cache, and 2 MB of graphics RAM, \$3,595. **Company:** Motorola Computer Group, Tempe, AZ; 800-759-1107 or 512-434-1526; <http://www.mot.com/GSS/MCG/>. **Reader Service:** Circle #401.

The second generation of the largest, fastest Mac spreadsheet has arrived.



Introducing Wingz 2.1

This new release of Wingz provides major enhancements in the area of performance, flexibility and ease of use. The architecture of the worksheet has been further extended to allow the most demanding data sets, and the user interface has been redesigned making it easier than ever to tap into the vast analytical power of the Wingz environment.

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|------------------------------|------------------------------|
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| Floating Toolbox | HyperCon Palettes |
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CIRCLE 128 ON READER SERVICE CARD

Claris Home Page



Easy-to-use page editor can't show you your work.

THE PROSPECT OF A WEB authoring tool from Claris is enticing: Imagine a product that brings the well-thought-out interfaces we've come to expect from Claris to the Web, which can be a nightmare of bizarre HTML tags and other strange Web formats. Claris Home Page meets many of our expectations. It's an excellent visual HTML editor for people new to the Web. But its quirks will limit its appeal to more-advanced Web authors.

When it comes to basic Web authoring features, Claris Home Page covers all the bases. You can apply styles to all the text on your pages by clicking on Home Page's attractive tool-bar buttons or by using menu commands. (Common styles, such as bold and italic, can also be applied via keyboard shortcuts, but overall we wished Home Page let us do more from the keyboard.)

Applying color to text is particularly easy: Highlight the target text, and then choose a color from a pop-up menu in the tool bar. You get five standard color options, listed by name (a boon to the color-blind — and to authors with grayscale PowerBooks), and an Other option, which invokes the Color Picker. We would have liked a way to add colors to the menu, and to change the definitions of others, in case our conception of red didn't match the program's designers'.

In Home Page, you specify the attributes of objects such as text, graphics, table cells, or form elements by using one of two floating palettes. The first of these, the link editor — for adding hypertext links to items — is so simple that it scarcely needed to be a stand-alone tool; it might have been better off integrated into another portion of the interface.

Home Page's other tool palette, the object editor, is where the program gets down to business. From this palette, you can add borders to images, specify cell alignments within tables, and make all the other modifications you'd expect from an HTML tool. Home Page conveniently hides esoteric HTML options that would confuse novices — such as tools for creating image maps within GIF files, and multicolumn headers within tables, for instance — but it keeps them readily accessible.

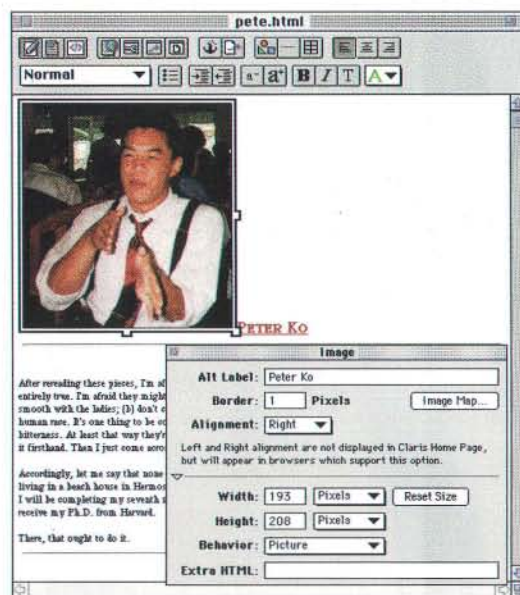
Clicking on a triangle at the bottom of the palette expands the window to provide access to the expert options.

One major drawback of Home Page's palettes: They're too wide. Even on a 17-inch monitor, the palettes got in the way and forced us to open and close them constantly as we worked.

Although this is only version 1.0, Claris Home Page supports most of the latest HTML options, such as variable text sizes, text colors, text wrap around graphics, and tables. This support will give novice Claris Home Page users an acceptable level of layout control for creating Web pages. But as the saying

a browser to display several HTML pages at once in different panes. However, Home Page lets you edit only the frame set itself: You can't place HTML pages in those panes and edit the pages from there. That means you have to constantly switch to a browser to see what your pages will *really* look like.

One feature in Claris Home Page is so important that it should be used every time anyone creates a Web page: When you select Document Statistics, Home Page calculates how long it will take for your page — including all placed graphics — to download. That way, Home Page can let you know when you're going overboard with the GIFs and JPEGs.



Claris Home Page's palettes

let you control objects on your page, but the program doesn't let you preview what your Web pages will look like when viewed by a browser. (Note that the expert options in the bottom of the control palette at the right can be hidden by a click on a Finder-style expand/collapse triangle.)

goes, the devil is in the details, and Home Page has some gaps that will frustrate intermediate and advanced authors.

WYS Isn't WYG

Key among Home Page problems is its failure to accurately display what a Web page will look like when viewed by a browser. The program can't show you how your page will look with text wrapped around a graphic, for instance. This means Home Page is nearly useless as a visual-design tool if you've got any wrapped images. Home Page also doesn't allow you to color table cells or specify fonts for text. And although Web browsers make an HTML table and its component rows and columns only as tall and as wide as they need to be to accommodate their contents, Home Page forces tables to the width of the editing window and displays all columns with equal widths.

Home Page does provide the ability to create frames, a Netscape innovation that allows

Home Page also lets you use FTP to transfer files to a remote Web server over the Internet — though this feature is inexplicably hidden: You have to hold down Option while clicking on the File menu to open or save files remotely.

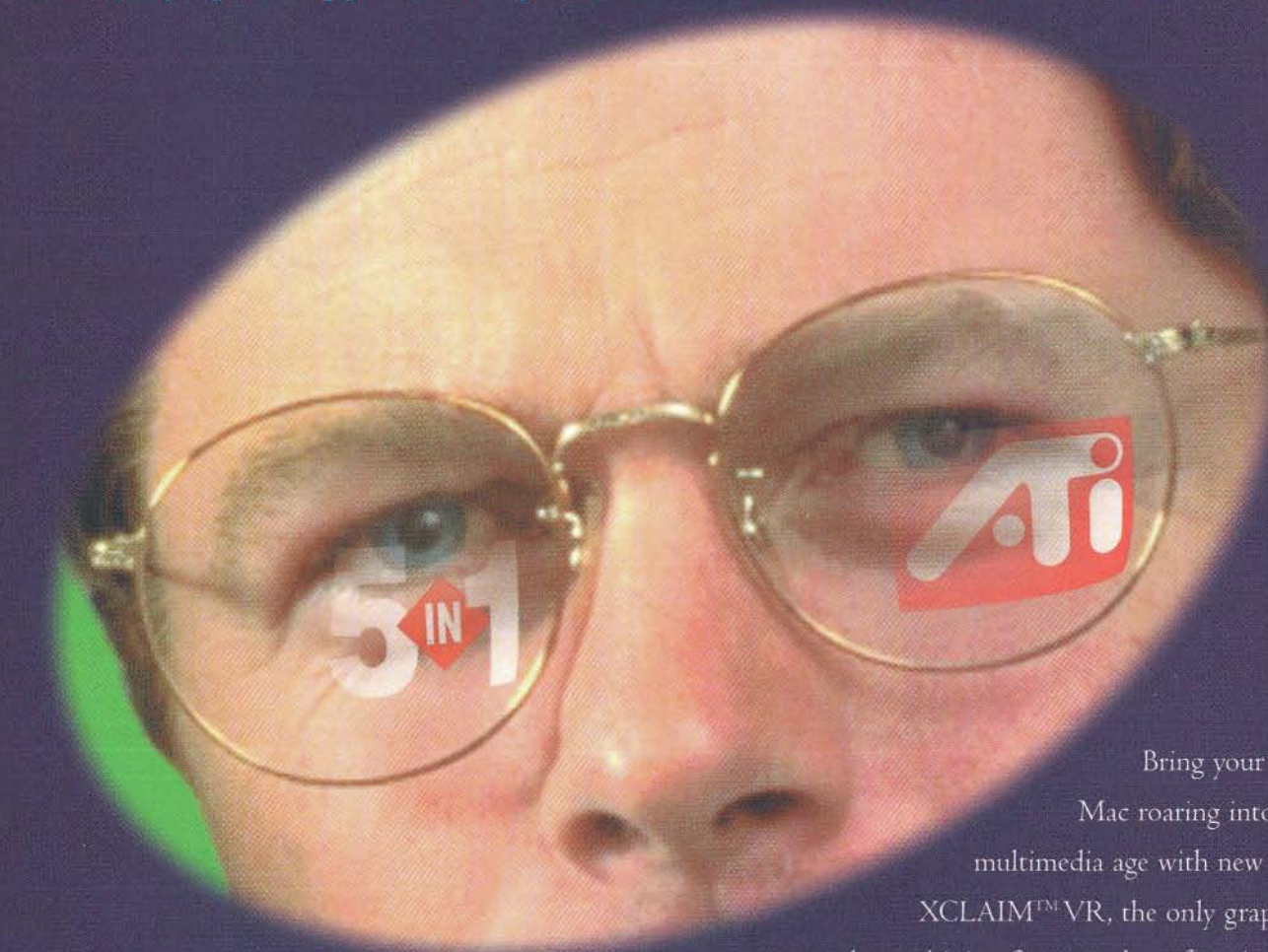
The Bottom Line

Claris Home Page is a simple, attractive tool that can make the process of building Web sites easy for novice Web authors. More-advanced users will be happy with its support of advanced HTML tags, but its recurring failure to display HTML pages accurately hinders its usability as a visual-prototyping tool. Home Page 1.0 is a clear improvement over Adobe PageMill 1.0, but with PageMill 2.0 waiting in the wings, Claris has some work to do if Home Page is ever to be the graphical Web authoring tool of choice. / Jason Snell

Claris Home Page 1.0, \$99 (list). **Company:** Claris, Santa Clara, CA; 800-325-2747 or 408-727-8227; <http://www.claris.com/>. **Reader Service:** Circle #402.

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CIRCLE 20 ON READER SERVICE CARD

Memory Managers

RAM Doubler 2 ★★★★★

RAM Charger 3.0 ★★★½

Software add-ons let you do more with less RAM.

WHEN YOUR MAC WANTS more memory but your budget says no, two software alternatives can come to your rescue: the newly upgraded RAM Doubler, version 2, and the freshly repackaged RAM Charger, version 3.0. Both work well, but RAM Doubler 2 shines brighter.

RAM Doubler 2 Triples Your RAM

Our first-draft write-up of Connectix's RAM Doubler 2 was among the shortest *MacUser* reviews ever: "Get it. You won't regret it."

But we figured you'd need more convincing. Fair enough; we'll elaborate. Like the original version, RAM Doubler 2 increases the amount of your computer's apparent memory — a 16-MB Mac acts as if it were a 32-MB Mac. It's similar to Apple's virtual memory, only it's faster and requires less disk space.

The new version goes a big step further: It triples, rather than merely doubles, your RAM — up to a maximum of 256 MB. And it does it without any perceptible speed penalty beyond the small one you get with the original RAM Doubler. Even with RAM at today's bargain-basement prices, that's still a super deal. Just bear in mind that RAM Doubler 2 works best when you use it to open more applications rather than to give an enormous amount of RAM to just one application.

Unlike the original RAM Doubler, this

version is a control panel, not an extension, and it lets you select the size of your RAM boost in five increments, from triple the installed memory to no boost at all. Even this last option has a benefit for users of PowerPC-based systems, especially those with PowerPC PowerBooks: It lets you dispense with RAM Doubler's battery-intensive use of the hard drive for virtual memory but still provides the file mapping that PowerPC-native applications use to conserve memory when virtual memory or RAM Doubler is turned on.

Our testing of RAM Doubler 2 revealed remarkable stability, even on systems loaded with extensions and other control panels. And if Connectix issues fixes as promptly as it did with the original RAM Doubler, any conflicts that do arise should be short-lived.

RAM Charger 3.0 Curbs RAM Hunger

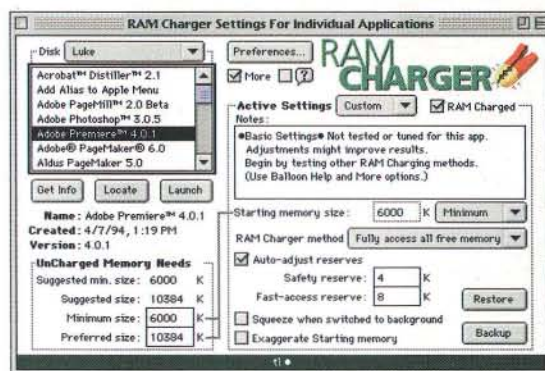
Instead of giving your Mac more memory, RAM Charger 3.0 works by "tuning" your applications so that they use less memory. Programs open at or near their minimum required level, with RAM Charger continually adjusting their RAM allotment as needed, in ways the standard Mac OS cannot on its own.

The benefits of using RAM Charger may not be as immediately obvious as they are with RAM Doubler, but they are significant. In our tests, half a dozen popular apps that would normally have required 16 MB of RAM, for example, needed only about 11 MB with RAM Charger. RAM Charger's approach can actually be more effective with the RAM-hungry apps that are RAM Doubler's weak spot. It also avoids the slowdowns associated with RAM Doubler and works with older Macs that can't use RAM Doubler.

But there's a catch: With RAM Charger, you must make a separate "charging" decision for every application. Fortunately, if you stick to basics, RAM Charger takes most of the hassle out of this process. It comes with a database of customized settings for most popular apps. If you have a program that is not in its database, RAM Charger's Standard setting will work in most cases.

(A few apps do not work with RAM Charger and should not be "charged" at all). A heads-up display remains on your screen at all times (unless you choose to get rid of it) to alert you to basic statistics about your memory savings. If all goes well, that's all there is to it.

But if problems develop or if you want to fine-tune RAM Charger to get every possible savings from a program, you have to fiddle with a series of adjustments in the RAM Charger control panel. Few people will even bother to learn these options, let alone actually use them. It's just not worth the effort. The Settings Wizard option can make recommen-



RAM Charger 3.0's imposing control panel is needed only when you want to "tune" the settings of a program.

dations after seeing how you use a program, but its advice is often too general.

If you already own RAM Charger, be aware that this version is not really an upgrade. Synchrony Softcorp has simply repackaged the version formerly marketed by Jump Development (only the graphics have changed).

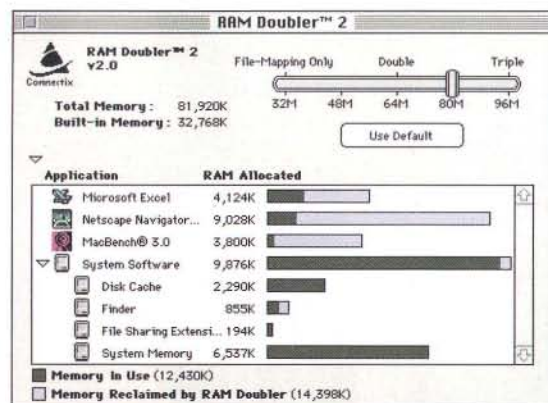
The Bottom Line

Either of these programs will give your memory a boost. Since they work in different ways, you can buy both and get more memory savings than you would with either one alone.

But there's a good reason why RAM Doubler has far outsold RAM Charger, even though RAM Charger was first to market. RAM Doubler is as close to a free lunch as you will ever find. In contrast, RAM Charger makes you work harder for generally less benefit. At current prices, you might be better off simply buying more RAM. / Ted Landau

RAM Charger 3.0, \$39.95 (list). **Company:** Synchrony Softcorp, Culver City, CA; 888-777-5600 or 305-228-5202; <http://www.synchrony.com/>. **Reader Service:** Circle #403.

RAM Doubler 2, \$99 (list). **Company:** Connectix, San Mateo, CA; 800-950-5880 or 415-571-5100; <http://www.connectix.com/>. **Reader Service:** Circle #404.



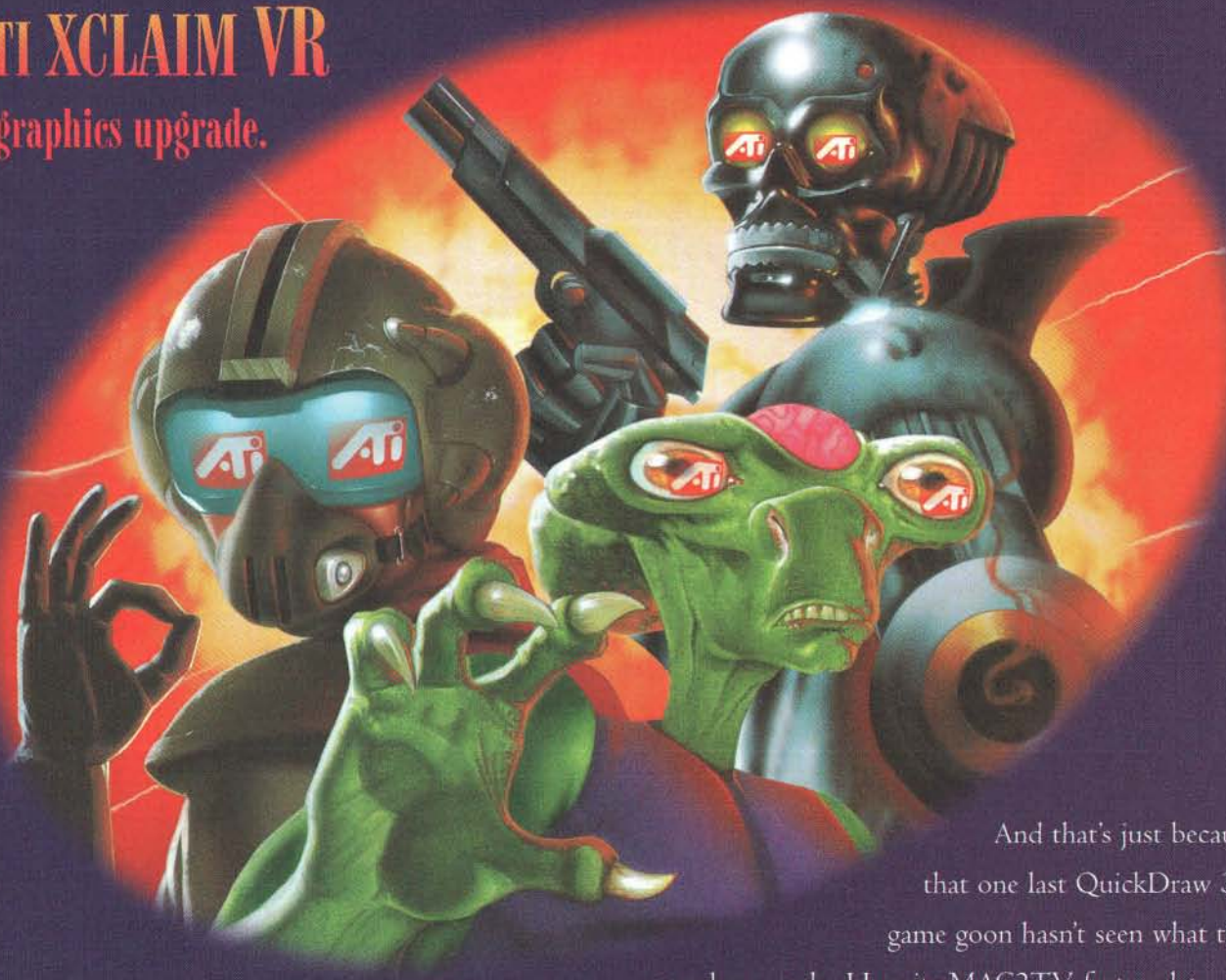
RAM Doubler 2's new control panel lets you decide how much RAM you want to add — and shows you how you're using the memory you've got.

3 OUT OF 4 GAME CHARACTERS SURVEYED

would rather humiliate and destroy you while playing on a MAC with an

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graphics upgrade.



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butter-smooth 3D detail and full-screen QuickTime video. Oh yeah, just in case your left brain demands some sensible reason to run right out and get one, XCLAIM™ VR does mean business apps, too. And in-your-boss's-face big screen presentations. And video capture from camcorders and VCRs.

MAC2TV

And VR on the Web. And because it's really five upgrades in one, you get more performance and features than a Power Mac 8500. On the other hand, XCLAIM VR costs just \$269*, so

chill out! See your dealer, or see more about it at www.atitech.ca.



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ColorSynergy 2.0



Affordable color-management tool gets modest upgrade.

CANDELA'S COLORSYNERGY WAS one of the first tools that allowed users to create ColorSync profiles for input devices, monitors, and output devices all in a single package, and it's still one of the least expensive, at \$495. We commended the original version for its wide support of color-measurement devices, including Light Source's Colortron and Colortron II and X-Rite's DTP 22, and for its innovative use of a calibrated scanner as a fast and inexpensive alternative to handheld measuring instruments. ColorSynergy 2.0 adds some useful new features and offers much-improved documentation, but it also lacks some fixes we'd hoped for, so overall we have to say it's a worthwhile but relatively modest upgrade.

Like its predecessor, ColorSynergy 2.0 is a complete product for creating ColorSync profiles: It lets you profile reflective and transparency scanners, monitors, and virtually every type of output device, whether it's a CMYK inkjet printer, press, or proofing system; a three-color CMY dye-sublimation or thermal-wax printer; or even an RGB film recorder.

Scanner calibration is the simplest task: You scan an IT8 target (a reflective target is included in the package) or a transmissive target (you can get one from Candela as well as from Kodak and Agfa) and then open the scan in ColorSynergy along with a data reference for the target. ColorSynergy compares the colors the scanner detected with the reference file and creates a "fingerprint" of the scanner's behavior.

For monitor calibration, ColorSynergy supports both Light Source's Colortron and X-Rite's DTP 92 Monitor Optimizer as hardware measurement options, and you can type in measurements taken with a nonsupported instrument. In case you don't have a hardware calibrator, ColorSynergy also lets you calibrate by eye. We found this method rather crude and much less useful than hardware calibration.

For output-device calibration, you first determine whether you're dealing with a three- or four-color device — some CMYK printers accept only RGB input and must therefore be dealt with as RGB devices — by printing a test

file generated by the application. Once you've identified your printer type, you print out an appropriate RGB or CMYK target file.

Next, you measure the target, either with an instrument such as a spectrophotometer or colorimeter or by scanning it on a calibrated scanner. The new version of ColorSynergy adds support for X-Rite's DTP 51 Auto Scan Colorimeter, a "strip-reader" that reads an entire strip of patches automatically — and quickly. Using a calibrated scanner is the fastest method of all, however, and we obtained some surprisingly good results with midrange scanners such as Microtek's ScanMaker III and UMAX's PowerLook, but even the best scanners are generally less accurate than spectrophotometers or colorimeters.



ColorSynergy's preview window lets you view simulations of your output, using various rendering and tone-compression methods.

With RGB printers, that's the whole process, but for CMYK printers, you need to take one additional step, setting the black generation and the total ink limit. Press manufacturers commonly supply recommendations for these settings, but if you're dealing with output devices such as dye-sublimation or color laser printers, you'll almost certainly have to go through a great deal of trial and error: ColorSynergy's manual is disappointingly silent on this important subject.

Once you've saved your profiles in ColorSynergy's own format, you can export them as ColorSync profiles; as Photoshop Monitor and Separation Table preference files; or in the case of output profiles, as PostScript Level 2 Color Rendering Dictionaries. You can also export chains of profiles — scanner to printer, or monitor to press to proofing printer, for example.

ColorSynergy 2.0 improves on earlier versions with the addition of support for spot colors: You can measure them directly with a spectrophotometer and then add them to a

palette that's calibrated for a specific device. This allows you to manage your color even in applications that don't support color management, such as Adobe Illustrator and Macromedia FreeHand.

Another new feature allows you to create new reference data files for IT8 targets by measuring the targets. In theory, you could do this anyway as long as you had a measuring instrument, but ColorSynergy makes the process much easier, by taking the values directly from the instrument and producing a correctly formatted data file. Longtime prepress pros will find this handy for restoring the values to targets whose data files are lost or that are so old that their data files may be outdated.

One annoying aspect of the Export window hasn't been fixed in ColorSynergy 2.0. You must choose the kind of file you want to export before you choose any other settings, because when you change the export type, all other settings you've specified in the window get wiped out. We often found ourselves needing to export both a ColorSync profile and a Photoshop table, and having to reset all the parameters gets old fast.

Two ColorSynergy add-ons, the batch-processing application ColorCircuitQ and the Photoshop plug-in CandelaCCT, are unchanged in this upgrade. They provide results that are slightly better than those from ColorSync, but only at the expense of much longer processing times.

The Bottom Line

This upgrade is hardly earth-shattering, but the new features are welcome additions to a very capable package. ColorSynergy 2.0 is by far the least expensive complete package for ColorSync profile creation, and although it doesn't make profile generation completely automatic, neither does any other package we've seen, including ones costing ten times as much. For users who simply want to profile their printer and scanner and who don't want to enter the brave new world of spectrophotometry, ColorSynergy 2.0's use of a calibrated scanner for measurement makes the program a particularly good deal. / Bruce Fraser

ColorSynergy 2.0, \$495 (list). **Company:** Candela, Burnsville, MN; 612-894-8890; <http://www.candelamn.com/>. **Reader Service:** Circle #406.

PowerBuilder 4.0 for Macintosh



Client/server veteran makes promising Mac OS debut.

ONE BY ONE, THE GREAT client/server database-development tools Windows users have enjoyed for years are migrating to the Mac OS. PowerBuilder, a popular Windows product since 1991, is the latest tool to make the leap, and version 4.0 (the version number is derived from the Windows product) is an impressively robust tool for client/server-database developers. But it lags behind its Windows counterpart — and several Mac competitors — in several key areas.

Object-oriented, powerful, and pricey, at \$3,295, PowerBuilder for Macintosh, from

outdated PowerBuilder 4.0 for Windows, and lacking several key features offered by its Windows sibling.

For your three grand, you get the basic PowerBuilder for Macintosh development environment; the Infobase library of tech notes; and Watcom SQL, a database that enables you to build PowerBuilder databases when you're not connected to a database server. You also get native drivers for Oracle 6 and Oracle 7 and Sybase SQL Server 4 and 10 databases, along with an ODBC driver for those of you with Microsoft SQL Server and similar databases to connect to. You will, however, require proprietary vendor middleware in order to connect to most other databases — for example, connecting Oracle or SQL*Net clients to Oracle 6 or 7 databases will cost you extra.

PowerBuilder uses two main components to link your application with that big database you're trying to manipulate — DataWindow and transaction objects. Transaction objects define the nature of the data that's accessible

from your application — which lists or fields you'll be able to see, for example. DataWindow objects organize the data you've retrieved and present it to users of your application in the manner you specify. A DataWindow can display database tables and a variety of other stored-data constructs, from SQL statements to previously stored queries. DataWindows let you display retrieved results in table, graph, spreadsheet-grid, or just about any other format — including some that feed into other Mac apps for further manipulation. This ability is truly impressive.

Crossed Platforms?

You can use PowerBuilder to create applications that run under the Mac OS, Windows, or UNIX — but the Mac version of the program isn't as platform-independent as its Windows counterpart: Applications created with PowerBuilder for Mac lack support for Windows' Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), and connection to third-party source-code-control systems. The program also lacks OpenDoc support.

Because versions of PowerBuilder for various platforms differ in their cross-platform capabilities, you'll essentially have to keep separate libraries of controls for each platform

if you're a cross-platform developer — a major project-management hassle. You'll also need to own a copy of PowerBuilder for each of your platforms, because each saved application includes platform-specific information. So much for real cross-platform development.

Note that PowerBuilder for Macintosh does *not* support the Mac as a PowerBuilder application server or allow Macintosh PowerBuilder clients to access server applications on non-Mac platforms — a big omission for cross-platform environments.

As you'd expect, PowerBuilder provides its own development language, called PowerScript. It looks a lot like the C language, and it's not all that hard to learn if you're already an experienced developer. If not, learning PowerScript will be a chore. But once you've got it down, you'll be able to take advantage of PowerBuilder's object-based design by linking scripts to events and objects. To help in this effort, Powersoft supplies a solid debugger and class libraries that allow objects to inherit properties, which saves a lot of coding.

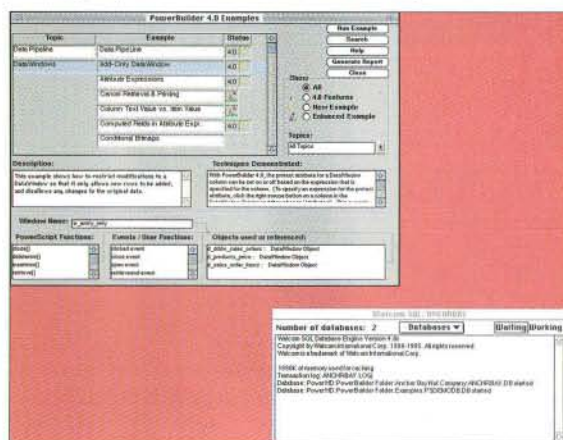
Since it's a costly database-development system, you would expect PowerBuilder for Macintosh to come with great documentation, help, and support. It does not disappoint. The online help is superb and the manuals complete — although the Macintosh-specific "Using PowerBuilder" guide is largely a compilation of instances where Mac OS-specific procedures differ from those in the more generic "Building Applications" manual. Still, you get a full set of examples to help you get started and comprehensive reference materials, and you can buy a variety of additional support programs as well.

The Bottom Line

PowerBuilder provides a powerful and highly versatile set of tools for developing client/server databases. And its object-oriented design and good documentation make it relatively easy to use, given its inherent complexity. But it's not PowerPC-native (a serious flaw that Powersoft will correct in the forthcoming PowerBuilder 5.0 for Macintosh), so its database access is sluggish. And even worse, its cross-platform functionality is spotty. PowerBuilder 4.0 for Macintosh is a promising start, but the program has a ways to go before it's a top-tier Mac product. / Don Crabb

PowerBuilder 4.0 for Macintosh, \$3,295 (list).

Company: Powersoft, Concord, MA; 800-395-3525 or 508-287-1500; <http://www.powersoft.com/>. **Reader Service:** Circle #407.



Interactive help and examples in PowerBuilder's electronic documentation let programmers learn the program quickly.

Powersoft, is not for keeping your address lists. Like its main Mac OS rivals — ACI US's 4th Dimension, Blyth's Omnis 7, and Microsoft's FoxPro — PowerBuilder is a tool for creating custom applications that use data already stored in big corporate SQL (structured-query language) or ODBC (Open Database Connectivity) databases. What's more, PowerBuilder offers excellent documentation and, given its long history, is more mature and easier to use than most other debut products.

However, it's also not PowerPC-native, despite the five-year wait Mac databasers have had to endure. Furthermore, it's a generation behind the latest version of PowerBuilder for Windows (version 5.0), slower than even the

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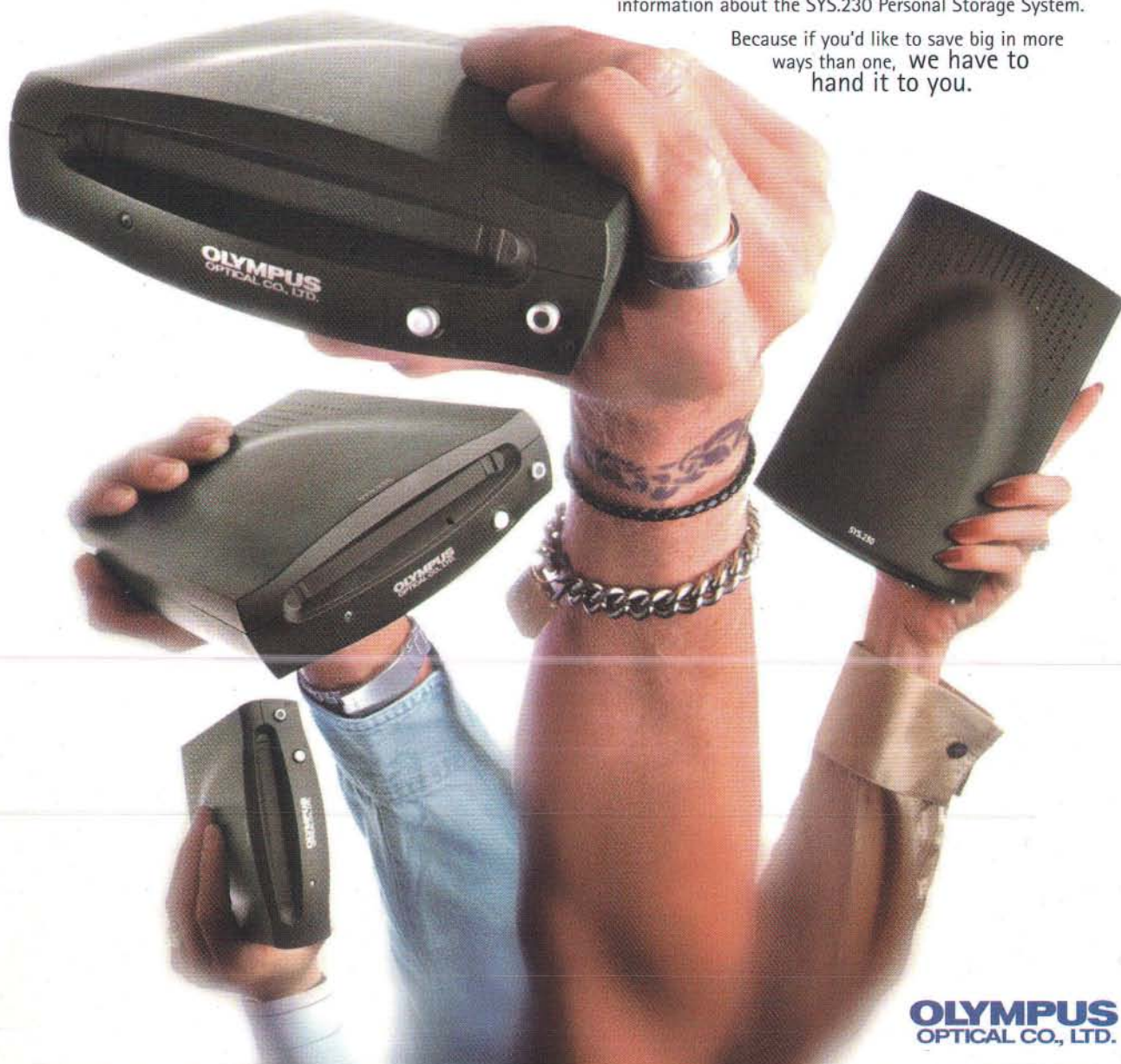
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CIRCLE 69 ON READER SERVICE CARD

EZ-Speak



PlainTalk macros help Macs listen up.

REMEMBER WHEN CASPER was still alive? Not the affable phantasm — Apple's speech-recognition technology: It caused a minor stir at its 1993 debut and then faded to near invisibility amid chilly user response. Since then, Apple has been quietly updating and extending the capabilities of Casper, now called PlainTalk, into a utility that's cool and fun.

Unfortunately, *useful* cannot be readily added to that list of descriptions — largely because the voice-commands included with PlainTalk are too limited. That's where Scantron Quality Computers' EZ-Speak comes in.

EZ-Speak is a collection of over 200 voice commands, including an extended set of Finder commands, such as Make New Folder, Restart, Shut Down, and Get Info; standard application commands, such as Cut, Copy, Paste, Undo, Open Document, and Quit This Application; and commands for five of the Mac's most popular applications: Microsoft Word, Microsoft Excel, Microsoft PowerPoint, ClarisWorks, and Netscape Navigator. EZ-Speak also installs over 100 Web-site voice macros for use in Navigator, and there is a command for adding voice-command bookmarks, or Voicemarks, for any Web sites. The selection of sites is impressive and, in combination with Voicemark, is one of EZ-Speak's most useful commands (no more typing in those long URLs or fussing with bookmarks).

Strictly speaking, EZ-Speak doesn't give you anything you can't get by stringing together the dozen or so Finder commands that ship with PlainTalk or programming voice-command applets in AppleScript. But even if you know how to program in AppleScript, creating your own voice commands can be time-consuming. (EZ-Speak helps out even here, by supplying a handy AppleScript template for creating voice-command macros.)

EZ-Speak's many new commands are cool, but they do come at a price: Adding hundreds of macros to PlainTalk's Speakable Items list really slows speech recognition down. The accuracy and performance of Apple's voice technology have improved tremendously in the last couple of years, but because PlainTalk must still compare what it thinks you said with

each voice command in its repertoire, all those EZ-Speak macros can slow response time down from a second or two to several seconds on a 150-MHz 604-based Power Mac.

Luckily, not many users will need all the commands included with EZ-Speak, and a little judicious pruning, especially of voice-command synonyms (such as Check Spelling and Spell Check) will bring performance back to acceptable levels. We just wish Scantron had used a customizable installer script so users could choose which application macros to install and thus avoid this tedious process.

The Bottom Line

Even with the addition of EZ-Speak, there really isn't anything you can do with PlainTalk that you couldn't do with a combination of key

commands, bookmarks, and aliases. However, one of the great things about using voice control, besides the coolness factor, is that it doesn't take up any space on your desktop or on your menus.

EZ-Speak does a great job of extending the functionality of PlainTalk and for \$49.95 is well worth it to save you the trouble of creating your own macros. The addition of clever voice commands such as Voicemark and the inclusion of an AppleScript template for creating your own voice applets (a major time-saver) make EZ-Speak a must-have for anyone interested in using voice commands on the Mac. / Andrew Gore

EZ-Speak, \$49.95 (list). **Company:** Scantron Quality Computers, St. Claire Shores, MI; 810-774-7200; <http://www.sqc.com/>. **Reader Service:** Circle #408.

Live Picture Overdrive



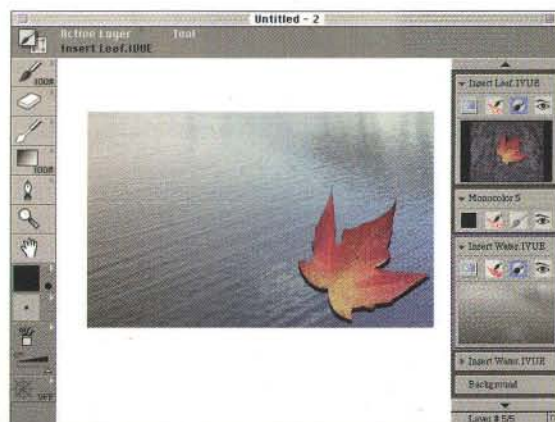
Affordable Photoshop companion speeds handling of big files.

IN THEIR NEVER ENDING SEARCH for more speed, Photoshop users typically turn to hardware enhancements: More RAM, faster CPUs, dedicated scratch disks, and multiprocessor or DSP accelerators are all effective — and expensive — ways of getting better performance for high-end, memory-intensive Photoshop work. For users who want a cheaper approach, Live Picture Overdrive provides a software-based option that offers a speedy, efficient means of creating composites and collages from large images that typically sap Photoshop's speed.

Overdrive is a stripped-down version of Live Picture's Live Picture 2.5, a \$695 professional application for creating and outputting high-end color composite images. Overdrive strips away more than two-thirds of Live Picture 2.5's price by dispensing with the program's editing and color-separation features: Support for Photoshop plug-ins is gone, for example, as are features such as cloning,

distortion, EPS insertion, and sharpen/blur. If you need any of those operations, you'll have to do them separately in Photoshop, before or after you're done compositing in Overdrive.

Overdrive retains some more-modest editing tools found in Live Picture 2.5, but its most impressive inheritance is the ability to handle multiple huge (50-MB or larger) image files speedily and in far less RAM than Photoshop requires. In Overdrive, as in Live Picture 2.5, opening and manipulating a 500-MB image takes no more time than opening and manipulating a 20-MB image. This capability derives from the company's proprietary IVUE file format and FITS editing technology. The IVUE format eliminates the need to load an entire image into RAM if you're working with only a small portion of it. FITS maintains a list of all the edits you've made to your



With Live Picture Overdrive, masking out the background of the high-resolution leaf image and layering it on top of the large water background image is fast and easy even in just 24 MB of RAM.

image(s) and applies them to any portion of the image you're viewing on-screen but renders them across the entire image only when you print your final image or save it in a non-IVUE format. FITS and IVUE together not only enable you to combine and navigate large images easily but they also store edits and color-correction operations made in Overdrive as layers that can be hidden or deleted at any time to deactivate your changes.

Live Picture Overdrive contains all the tools you'll need in order to layer and composite multiple Photoshop images into a single file, and it also offers good color-correction tools and simple paintbrushes. Overdrive can also use a layer's alpha channel to create an image mask automatically — a real boon for compositing work. (Although you can do this in Photoshop's layers as well, Overdrive is far, far speedier.)

Although the idea of editing in Photoshop and compositing in Live Picture Overdrive is sound, there will still be times when you'll wish for more editing power in Live Picture Overdrive. If you want to perform an edit that spans layers (blurring one into another, for example) or make an edit that requires seeing more than one layer at a time (if you need to register an object in one layer with an object in another layer, for example), you're simply out of luck.

Careful planning can obviate some of these problems, but application switching can still be tedious. To facilitate cross-program editing, Live Picture offers a free reward for registering Overdrive: Total Integration's FastEdit/IVUE, an Acquire plug-in that lets you selectively open parts of an IVUE image for editing in Photoshop.

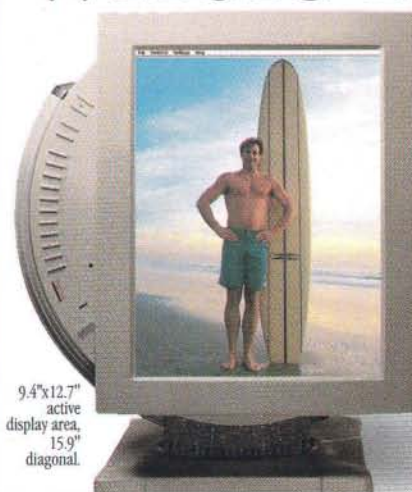
Live Picture Overdrive's memory requirements are small (24 MB), meaning you don't need mountains of RAM to keep both LPO and Photoshop open at the same time.

The Bottom Line

Live Picture Overdrive is a great deal for Photoshop users on a budget who need to composite large images — or who want to get started working with multiple high-resolution files. Live Picture Overdrive's interface can take a bit of getting used to, but the program's speed is luxurious and the multilayered-editing approach powerful. / Ben Long

Live Picture Overdrive 1.0, \$195 (list). **Company:** Live Picture, Soquel, CA; 800-724-7900 or 408-464-4800; <http://www.livepicture.com/>. **Reader Service:** Circle #409.

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INTERNET SERVICE PROVIDER SHOWDOWN

In February's Networking section, MacUser takes a good look at how to pick the right service provider based on features, quality of service, price and Mac friendliness. MacUser helps pave the way to the Internet!

WEB ANIMATION TOOLS

With millions of Web pages fighting for attention, it's every Web designer's goal to create a page that jumps out of the crowd. That's why animation on the Web is such a hot ticket these days. Noted digital designer Lynda Weinman, author of *Designing Web Graphics*, 1996, gives a frame-by-frame run-down on the four types of animation tools — GIF animation, plug-ins, programming and streaming movie formats. For the first time ever, MacUser mouse-rates all the leading Web animation tools so that readers can see which tool is best for which job. You can say you saw it first in MacUser.

LOW-COST FLATBED SCANNERS MACUSER LABS REPORT

If you're shopping for a low-cost color flatbed scanner to get images onto the Web or into a snazzy document, then the February issue of MacUser is a must-read for you! In addition to reviewing and mouse-rating close to 15 low-cost color flatbed scanners all priced under \$1,000, MacUser editor, Roman Loyola, also gives expert advice on how to buy a scanner, scanning jargon, and scanning rules-of-thumb. Backed by serious benchmark testing done by the experts in MacUser Labs, MacUser makes buying risk-free.

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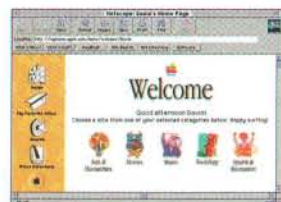


Your personal education.

It comes with some of the most popular educational software already installed and runs hundreds of other educational programs that make learning more fun—to help kindergartners learn to read and write, high school kids prepare for college or grown-ups master a second language.

Your personal finances.

The Performa 6400 computer brings the point-and-click simplicity of a Macintosh to a wide range of software for managing your family finances—programs like Quicken that help you do your taxes, track your investments and balance your checkbook.



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How much more personal c

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Your personal computer.

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And although the life span of some computers may appear to extend just beyond that of the average goldfish, we've loaded the Performa 6400 with ample power and plenty of expansion options so you and your family will enjoy it for years to come.

It's everything a family computer should be. For the name of the Apple reseller near you, and for information on special holiday promotions, call 800-446-3000, extension 100. Or visit us on the Internet at www.apple.com/

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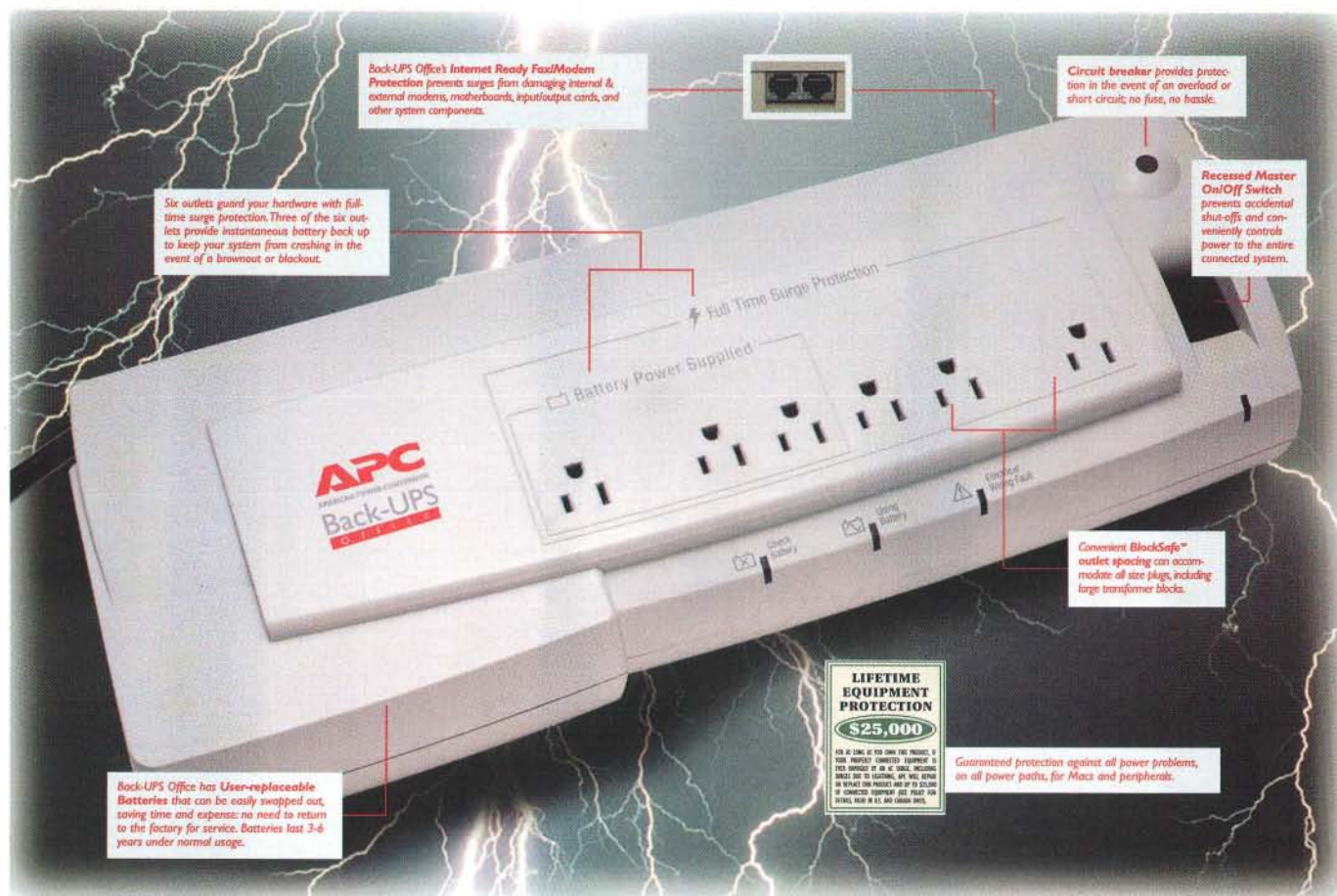
Your personal growth.

There's more than enough power for today's applications and plenty of expansion options that make it easy to add functionality no matter what you want to do—now, and down the road. When your family grows, your Performa grows with you.



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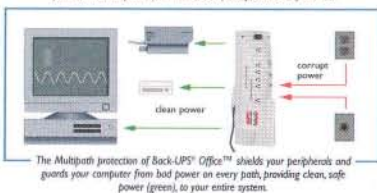
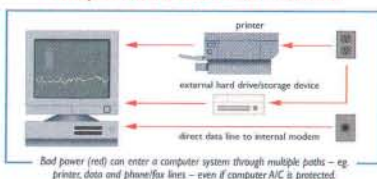
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Number of Block Outlets			2
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Spike	+	+	+
Blackouts	+	+	+
Brownouts	+	+	+
Overvoltage	+	+	+
Typical Runtime in Minutes			
with Pentium 100 w/17" monitor		10	10
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PC	+	+	+
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Tango for FileMaker

★★★★★

Provide access to FileMaker databases over the Internet.

WHAT FILEMAKER PRO DID for databases, Tango for FileMaker hopes to do for searchable Web sites. Simply put, Tango makes it easy for you to publish your FileMaker database on the Web. And befitting a product that works hand-in-glove with the elegant FileMaker Pro, Tango does its work via a full-featured, easy-to-use graphical interface.

Like other database-publishing tools (including its sibling, Tango, a tool for searching SQL client/server databases over the Web), Tango for FileMaker includes a CGI (Common Gateway Interface) application that resides on your Web server. The CGI processes database queries issued in the World Wide Web's common language, HTML (HyperText Markup Language), and it returns responses in the form of HTML pages. Tango differs from other FileMaker CGIs, however, in its simplicity. It spares you the HTML coding and thorny FileMaker calculating other CGIs require.

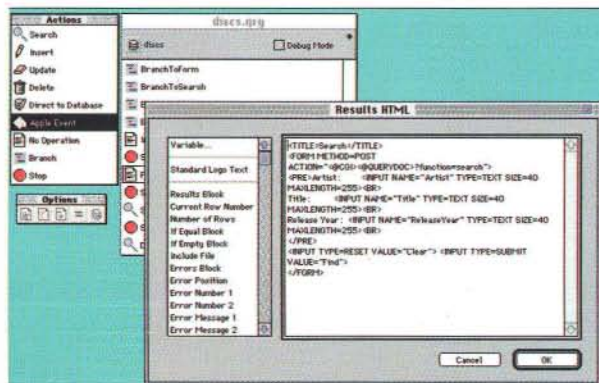
With Tango for FileMaker, you create the Web-interface database fields by dragging and dropping the fields or choosing pop-up-menu options. As you do so, Tango creates the HTML for your Web interface automatically. TangoEditor, the application you use for building Web-based forms, also gives you some display-formatting options, again without HTML coding, and a nifty feature called HTML Snippets, which lets you specify and store HTML text (such as pointers to a logo, or navigation links) that can be added to your database pages with a click.

Beyond the appearance of your Web interface is the deeper business of specifying what portion of your database will be accessible via the Web and how you want your published database to respond to information requests that come in over the Web. In Tango, you use

tools called Query Builders to accomplish these tasks — and the tools are exceptionally easy to use. TangoEditor reads layout and field names from the database and displays them in a palette. To assign functions to fields, you drag the fields from the palette and drop them onto the editing window, where you can specify their behavior.

Tango's Query Builders generate scriptlike files called query documents, and when you open one by double-clicking, the drag-and-drop Query Builder environment gives way to a powerful text-based editor. Here, you can invoke Apple events, specify a variety of responses to HTML errors, edit raw HTML, and much more.

Tango for FileMaker's 24-lesson tutorial offers a wealth of examples. The step-by-step guide takes you from creating a simple search form to launching a product database that can



The TangoEditor application's query editor lets you edit the raw HTML that lies behind the forms and error pages of Web-searchable FileMaker databases.

calculate sales tax or markup percentage.

Tango is no speed demon. We performed simple database queries over a quiet Ethernet network and experienced noticeable delays. Tango for FileMaker also has one potentially troublesome problem. Although the CGI can invoke FileMaker scripts, the feature works only if FileMaker is the active application — which effectively means you have to keep your published database on its own system.

The Bottom Line

Tango for FileMaker leads the field in user-friendly Web database publishing. Expect plenty of competition in the months ahead, but for now, it's the tool of choice for FileMaker users. / Shelly Brisbin

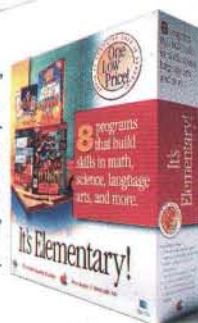
Tango for FileMaker, \$349 (list). **Company:** EveryWare Development, Mississauga, ON, Canada; 888-819-2500 or 905-819-1173; <http://www.everyware.com/>. **Reader Service:** Circle #410.

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Howtek Scanmaster 7500 Pro



Drum scanner adjusts itself to user's skill.



ALTHOUGH RECENT YEARS have seen advances in high-end flatbed scanners, drum scanners still lead the way in generating the best digital images possible. The Howtek Scanmaster 7500 Pro desktop drum scanner doesn't have all the features of top-of-the-line drum scanners, but its ease of use and outstanding software make it an excellent choice for prepress environments that require high volume and high quality — such as ad agencies and many graphic-arts houses. And although its just-sub-\$60,000 price may not sound like a bargain, it's comparable to that of high-end flatbed scanners whose abilities the 7500 matches or exceeds.

The 7500 captures its images by using three matched PMTs (Photo Multiplier Tubes) rather than a CCD (charge-coupled device) array like those found in flatbed scanners. PMT technology is known for delivering high-quality scans, and indeed, the images we captured on the 7500 consistently exhibited fewer artifacts and less noise than those from any of several high-end, large-format flatbed scanners. What's more, unlike many flatbeds, the 7500 can scan transmissive and reflective targets at the same time.

The 7500 offers 12-bit-per-channel color; 5,000-dpi optical resolution, interpolated to 16,000; two drum sizes, 11.5 x 18.5 inches and 24 x 18.5 inches; a SCSI-2 interface; and outstanding dynamic range (3.8 out of a possible 4.0). The 7500 is capable of scanning in both the RGB and CMYK color spaces. It captures data in CMYK by use of a specialized processor that converts from RGB to CMYK on the fly. An option on some scanners, this hardware approach to color conversion is standard with the 7500.

Prepping artwork for use in the 7500 is easy: Just attach one or more originals to the

drum with a low-tack, low-residue tape, and then place the drum in its mount inside the scanner. Because Howtek includes two drums with the 7500, you can prep one job while another is being scanned. An optional mounting table (\$1,295 list) furnishes an extra drum mount and can speed production even more.

The 7500 gives you the option of including multiple originals — reflective prints, transmissive slides, or a combination of both — in a single job. To scan multiple images in one job, you perform a prescan and then use the 7500's scanning software to outline each original. You can capture each image separately or batch them for speedy capture. Either way, the scanner calibrates itself before scanning each image, to ensure high color accuracy.

Smart Software

No matter how good your scanner hardware is, good software is critical to getting the best-possible output. We tested the 7500 with Howtek's new scanning application, Trident SE 1.1, and were impressed with the software's complement of tools, which are well designed to meet the needs of scanning novices as well as seasoned pros.

Trident gives you several levels of control. First, you choose the degree of freedom you'll have in correcting your image, by choosing between the hands-on SE (Separator Edition) mode and the more automated PE (Photo Edition) mode. Within each of these are two additional options that determine the extent of your ability to fine-tune color corrections of scanned images: In Production mode, the software handles corrections largely on its own; in Expert mode, you're free to tweak your way to exacting accuracy.

The beauty of the Trident application is its flexibility and ability to scale to the needs of expert and novice operators alike. Without sacrificing any of the 7500's scanning capabilities, Trident in PE mode allows inexperienced operators to generate professional-quality scans easily. A seasoned operator using Trident in SE Production mode can opt for greater control and correction, and the SE Expert mode provides perfectionists with extensive tools, including full gradation control, tone curves, cast removal, dot gain, and gray balance.

Trident's SE Expert controls provide outstanding precision and fine-tuning, but with that sophistication comes complexity. Many tools are nonintuitive and difficult to learn, in part because they don't follow standard Macintosh OS interface conventions. The spotty Trident manuals don't always help either. Once you're over the learning curve, however, you have a truly top-class set of tools at your disposal.

The Bottom Line

For scanning environments that generate ten or more scans a day, the Howtek Scanmaster 7500 Pro and the outstanding Trident SE software are excellent tools. The 7500 performs extremely high-quality scans, and Trident not only makes it easy for novices to get professional results quickly but also offers advanced tools for scanning veterans. The 7500 will quickly pay for itself in saved service-bureau fees. / Rick Oldano

Howtek Scanmaster 7500 Pro, \$58,900 (list, including Trident SE software). **Company:** Howtek, Hudson, NH; 800-444-6983 or 603-882-5200; <http://www.howtek.com/>. **Reader Service:** Circle #411.





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MasterJuggler Pro 2.0



Update to font-management stalwart can't match competitors.

LIKE OTHER FONT-MANAGEMENT utilities, Alsoft's MasterJuggler Pro lets you create font sets that can be opened or closed in one step, freeing you to organize your fonts in your own folders. And it resolves font-ID conflicts. But even newly updated, this tried-and-true font manager is rather awkward and some of its included utilities are outdated.

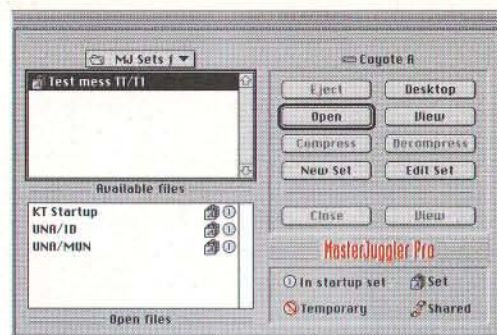
MasterJuggler's font sets are ordinary Mac files, which makes them easy to back up and archive. They're also easy to lose track of or delete accidentally. You must also remember to store them in a single folder, or they're likely to end up all over your hard disk. Alsoft tacitly acknowledges this problem by including a utility for finding errant set files.

The program creates two types of sets: startup, which open automatically when you

boot, and temporary, which you can open as needed. Temporary sets normally close when you shut down, but if your system crashes, MasterJuggler will thoughtfully reopen any temporary sets that were active, when you restart.

MasterJuggler's main window looks straightforward, but until you get used to the program, its odd interface makes it difficult to use. MasterJuggler buttons don't mean what you think they should. For instance, clicking on the Temporary or In Startup Set buttons doesn't control whether you create a temporary or startup set.

MasterJuggler Pro ships with a motley grab bag of utilities. Some, including the Font/DA Utility, address problems that are all but extinct on modern Mac OS systems. Others, such as PowerTalk KeyChains and Font Gathering (a far-from-automatic tool for collecting fonts for transport to a service bureau), are also less than essential. Font Guardian, however, is truly helpful: It reports defective suitcase or outline fonts, duplicate fonts, and missing printer outlines. Set Converter, which converts sets from Symantec's Suitcase 2 font-management



Baffling buttons in MasterJuggler's primary control window don't behave as you'd expect.

program to MasterJuggler format, is somewhat handy — although it ignores MasterJuggler's real rival, the current Suitcase, version 3.

The Bottom Line

Despite its interface quirks, MasterJuggler is almost as good as Suitcase 3. But it needs a major overhaul for the next round of the font-management game, as forthcoming programs promise such advantages as the ability to open font sets automatically when you launch applications or documents. / Kathleen Tinkel

MasterJuggler Pro 2.0, \$89.95 (list). **Company:** Alsoft, Spring, TX; 800-257-6381 or 713-353-4090. **Reader Service:** Circle #413.

Little known Mac fact #9

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No one likes working late at the office. So why not take your work home? MacLinkPlus lets you use virtually any PC-based word processing, spreadsheet or graphic file on your Mac. With all formatting intact. It doesn't matter if you use Microsoft Office at work and ClarisWorks at home. Or Microsoft Works at home and WordPerfect at work. Or thousands of other combinations. MacLinkPlus lets you bring files back and forth with ease. Sure there are lots of reasons why you can't make it home on time. But at least with MacLinkPlus, incompatible file formats doesn't have to be one of them.

For details, call 1-800-270-0030 ext. 126 or visit our Web site at <http://www.dataviz.com/maclink9>.



Nightingale 3.0



Sweet-sounding notation program hits high notes, however unevenly.

LIKE THE BIRD IT'S NAMED after, Musicware's music-notation program, Nightingale, is uniquely talented and beautiful, but after a time, its quirks can wear a bit thin.

Nightingale costs \$250 less than its main competitor, Coda's Finale, but it gives you many of the same features, including Standard MIDI file transcription, real-time transcription, up to 64 staves and 100 voices, automatic transposition, and WYSIWYG display and printing. It even has a few talents Finale doesn't. Even though it's not PowerPC-native, Nightingale is faster than Finale. It also has a freely distributable playback utility called NoteView, which lets anyone view and, via MIDI, play your Nightingale scores.

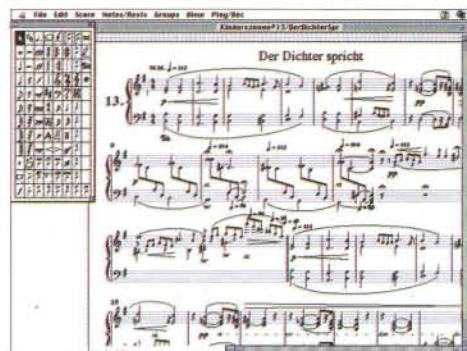
Finale also doesn't offer anything like Nightingale's \$149 NoteScan add-on, which lets you scan printed music sheets and turn them into editable scores.

Nightingale's clean interface makes it easier to use than the comparatively cluttered Finale. Tools for inserting notes, rests, chord symbols, clefs, key signatures, and dynamic markings are in one floating palette. The clever Quick-Change dialog box gives you a pull-down menu that has only the options appropriate for changing a selected element in the score.

Nightingale's clean layout extends to the way measures are handled. Unlike notation programs that force you to manually move notes, rests, and bar lines to accommodate a flurry of notes, Nightingale expands and contracts bars to maintain a legible score.

Alas, lest we sound *too* overjoyed, Nightingale has several niggling annoyances. For one, you can't copy more than one music staff at a time. Nor can you copy and paste separate voices from within a single staff. You'll also find yourself reverting all too often to a previously saved score because you can't Undo.

Even more vexing are the note-recognition problems in the NoteScan add-on and its lack of hard-copy documentation. And although NoteScan does a respectable job with scores containing one-line, single-note melodies, its recognition accuracy plummets with more-complex manuscripts.



In Nightingale's floating palette, you have easy access to most of the tools you need in order to create or edit your musical manuscript.

The Bottom Line

If you are in the market for a powerful and easy-to-use music-notation program for a not-too-steep price, Musicware's Nightingale is worth considering, especially if you have a scanner and are planning to do some editing and annotating of printed scores. If you can live with Nightingale's off notes, you'll discover that this bird produces some sweet music.

/ Christopher Breen

Nightingale 3.0, \$495 (list). **Company:** Musicware, Redmond, WA; 800-997-4266 or 206-881-9797; <http://www.halcyon.com/musicware/>. **Reader Service:** Circle #414.



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Retrieve It! 2.5



Utility searches the Internet as well as your disks.

EVEN WITH ITS SYSTEM 7.5 face-lift, Apple's Find File extension is looking tired, especially in comparison to Retrieve It! 2.5. This impressive find-file utility now not only finds files by name or by words they contain but also cleverly connects to Internet search engines.

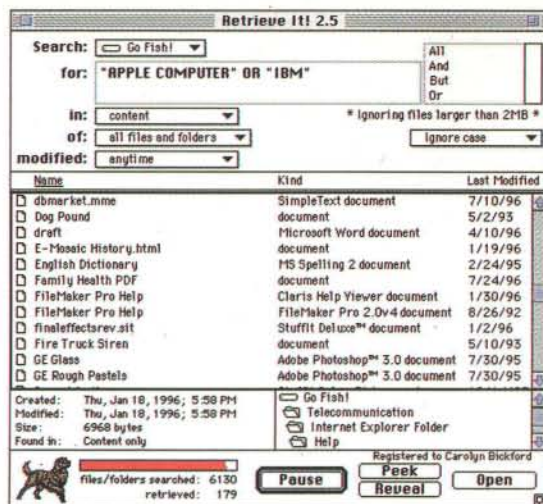
Retrieve It! is able to search through any mounted volume or individual folders to find a file by its name. It can also search through each file's content for individual words. Content searches can take several minutes but are invaluable when you don't remember which file has the information you're looking for. You can search by using operators, which include the run-of-the-mill AND, OR, and NOT as well as more-advanced operators that let you specify how many words apart one keyword can be from another, for instance. You can further narrow your search, screening files by modification date or using a list of creator

types Retrieve-It! generates for you. When Retrieve It! finds a file that matches your criteria, the program adds it to a list in a scrolling window.

Internet Bloodhound

These features alone give Retrieve It! a solid edge over Apple's Find File, but we were even more impressed by Retrieve It! 2.5's ability to integrate with Internet search engines. From within the Retrieve It! window, you can select among the five most popular Net search services — Yahoo, Alta Vista, Excite, Infoseek, and Lycos — to search World Wide Web pages. You can also choose among more-specific search services to find news, stock prices, e-mail addresses, classified ads, or Usenet postings. When you initiate a search, Retrieve It! launches your Web browser and opens the first page of results.

Retrieve It! is an application, not an extension, so extension conflicts will not be a problem. However, this also means that if you want to invoke it by use of the Command-F key combination, you'll have to use a third-party utility.



Search the World Wide Web as easily as you search for information on your hard disk with Retrieve It!.

The Bottom Line

Find-file utilities that outshine Apple's old workhorse aren't new, and many have esoteric features that MVP Solutions' program doesn't. But Retrieve It! is the first that's easy and practical enough to permanently replace the Find File extension on our system. / Carolyn Bickford

Retrieve It! 2.5, \$65 (list). **Company:** MVP Solutions, Mountain View, CA; 415-562-3457; <http://www.mvpsolutions.com/>. **Reader Service:** Circle #415.

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Infini-D 3.5



New features improve on good 3-D package.

THE LATEST UPDATE TO INFINI-D, Specular's integrated 3-D-modeling, -rendering, and -animation program, adds a winning combination of new features and enhancements to an already friendly and affordable 3-D package. Seasoned Infini-D users will appreciate impressive new features such as the ability to perform Boolean operations when rendering and to customize and animate lens-flare effects. New users and old alike will appreciate several ease-of-use improvements to Infini-D's controls.

Infini-D users have long coveted more-expensive 3-D packages' ability to perform Boolean operations — the creation of new objects by adding or subtracting the volume of one object to or from another. Infini-D 3.5 partly satisfies users' desires with the introduction of Boolean rendering. You can designate any object in Infini-D 3.5 as a negative object or an intersection object; a negative object can subtract its volume from another object, whereas an intersection object adds its volume to that of other objects. This approach differs from true Boolean modeling in that the merger of two shapes in Infini-D 3.5 doesn't actually create a new object geometry; both of the original shapes remain in your scene (although either or both can be made invisible). But careful grouping of these objects enables you to achieve many of the same results you'd get with a far more expensive Boolean modeler. What's more, you can animate negative and intersection objects just as you would any other in Infini-D. This allows for dynamic effects such as having a sphere's volume subtracted from a cube as the two pass through each other — or having invisible objects take bites from a rendered apple.

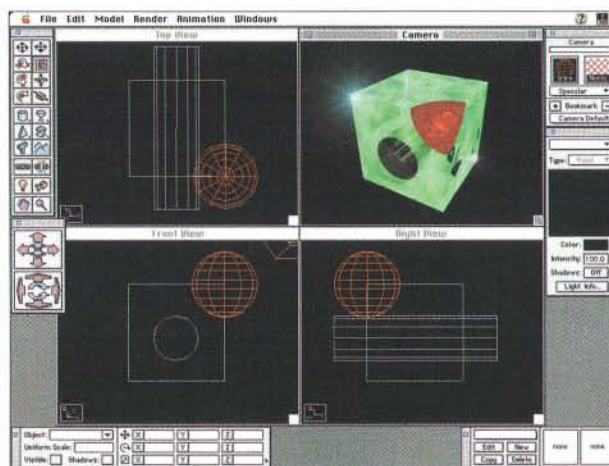
SuperFlares, another feature that's new to Infini-D 3.5, is one that users may not have been pining for — but it's one they'll quickly find many uses for. SuperFlares are lens-flare effects that let you customize any light source in an Infini-D project — whether it's in your scene or illuminating it from offstage. Using SuperFlares allows you to replicate a host of real-world lighting effects such as a halogen searchlight, a laser, or a smoldering coal.

Infini-D includes SuperFlare presets for a variety of effects, but the real power of SuperFlares comes as you manipulate light-source characteristics such as brightness, aspect ratio, flare and glow color, reflection style, streak pattern, halo, and obfuscation (by other objects in front of the light source). You can save and reuse any combination of these settings and animate changes in them over time. Sample animations that ship with Infini-D 3.5 — including a sweeping searchlight and an igniting rocket engine — illustrate SuperFlares' potential and provide good understanding of how it can be put to use.

Adding to the usefulness of SuperFlares is a new Infini-D object type, the Shadow-Catcher, which is rendered only where other

Infini-D's Workshop, where 2-D objects can be extruded, swept, or lathed into 3-D objects, has also been improved: Keyboard arrow keys can be used to nudge selected elements, and multiple EPS outlines can now be imported into one cross section. Most of the Workshop's tools can now be selected with keyboard equivalents.

Interface and general improvements round out Infini-D 3.5's new features. The new Navigation Floater is a handy palette that provides xyz navigation control for the scene windows and pitch/roll/yaw controls for camera windows. Importing images (as textures and backgrounds) can be done via the Surface menu, and multiple images can be imported at the same time, streamlining production.



Realistic, dramatic lighting effects are possible with Infini-D 3.5's new SuperFlares feature.

objects' shadows fall upon it. You control the shadows' transparency by setting the Shadow-Catcher objects' surface transparency. Use of ShadowCatcher allows you to render cast shadows into an alpha channel or a background image, which greatly simplifies the placement of 3-D objects with shadows into 2-D images — such as you might do in Adobe Photoshop.

A host of other features enhances the performance and versatility of Infini-D's modeler. Ray tracing for spline-based as well as polygonal objects has been accelerated (with speed increases depending on the user's system). True transparency and refraction rendering are now available in all shading modes, which improves accuracy of previews in faster shading modes. And if you ever create animations for broadcast or videotape playback, you'll appreciate the new optional Safe Title and Safe Action indicators, which outline the portion of your scene that will be clipped when your image is converted for a TV screen.

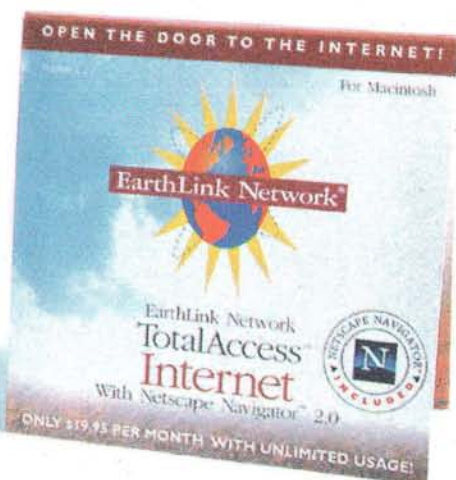
Version 3.5 allows you to set and save the rendering resolution and ruler increments for each scene independently, rather than forcing you to switch global preferences in order to change them. Infini-D 3.5 has also added support for user-definable scratch disks and animation-filename suffixes. QuickTime VR support is slightly improved through autorotation of tall camera windows and the availability of QTVR movie presets.

The Bottom Line

Infini-D 3.5 is a worthwhile upgrade to an already comprehensive and easy-to-use tool set for beginning 3-D artists. New features such as SuperFlares and Boolean rendering enable users to achieve effects that would otherwise require a significantly more expensive package. / David Biedny and Nathan Moody

Infini-D 3.5, \$449 (estimated street). **Company:** Specular, Amherst, MA; 800-433-7332 or 413-536-3100; <http://www.specular.com/>. **Reader Service:** Circle #416.

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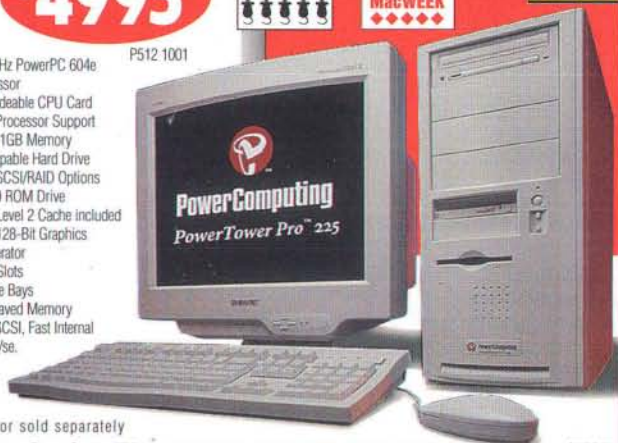
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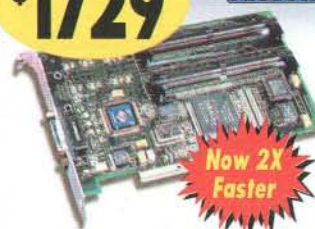
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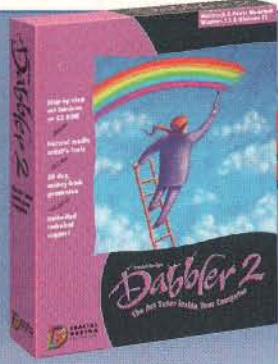
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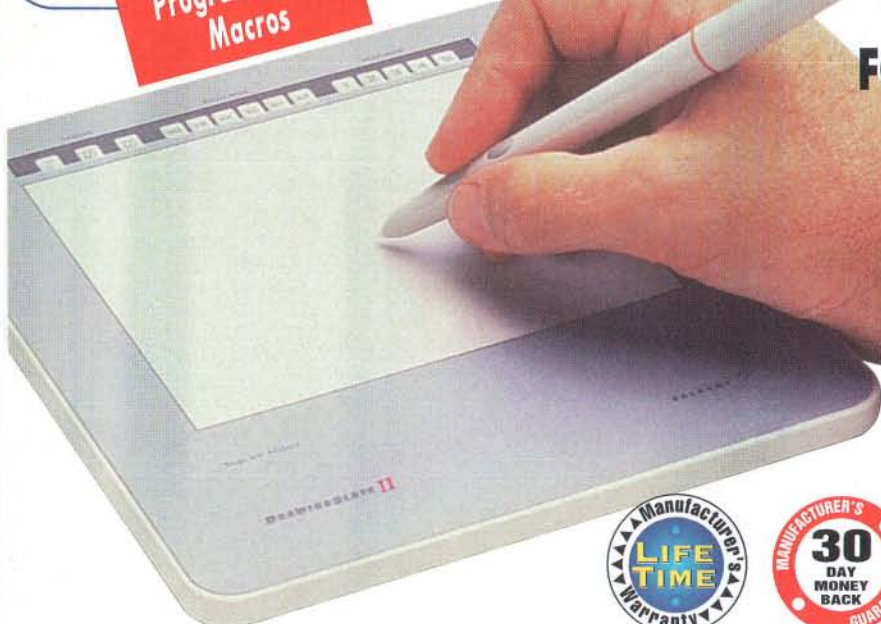
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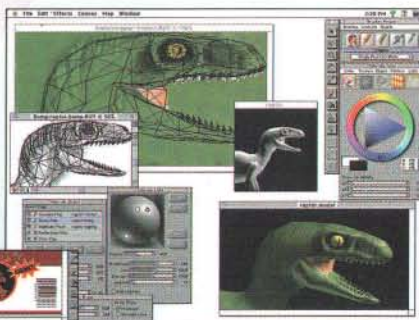
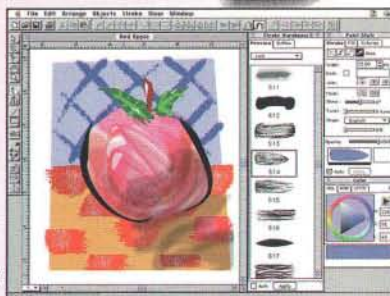
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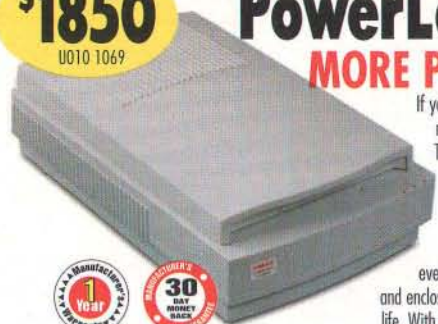
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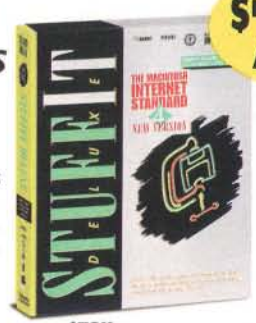
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You won't hear screaming tires,
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masters the course without a hitch.

THE APPLE POWERBOOK

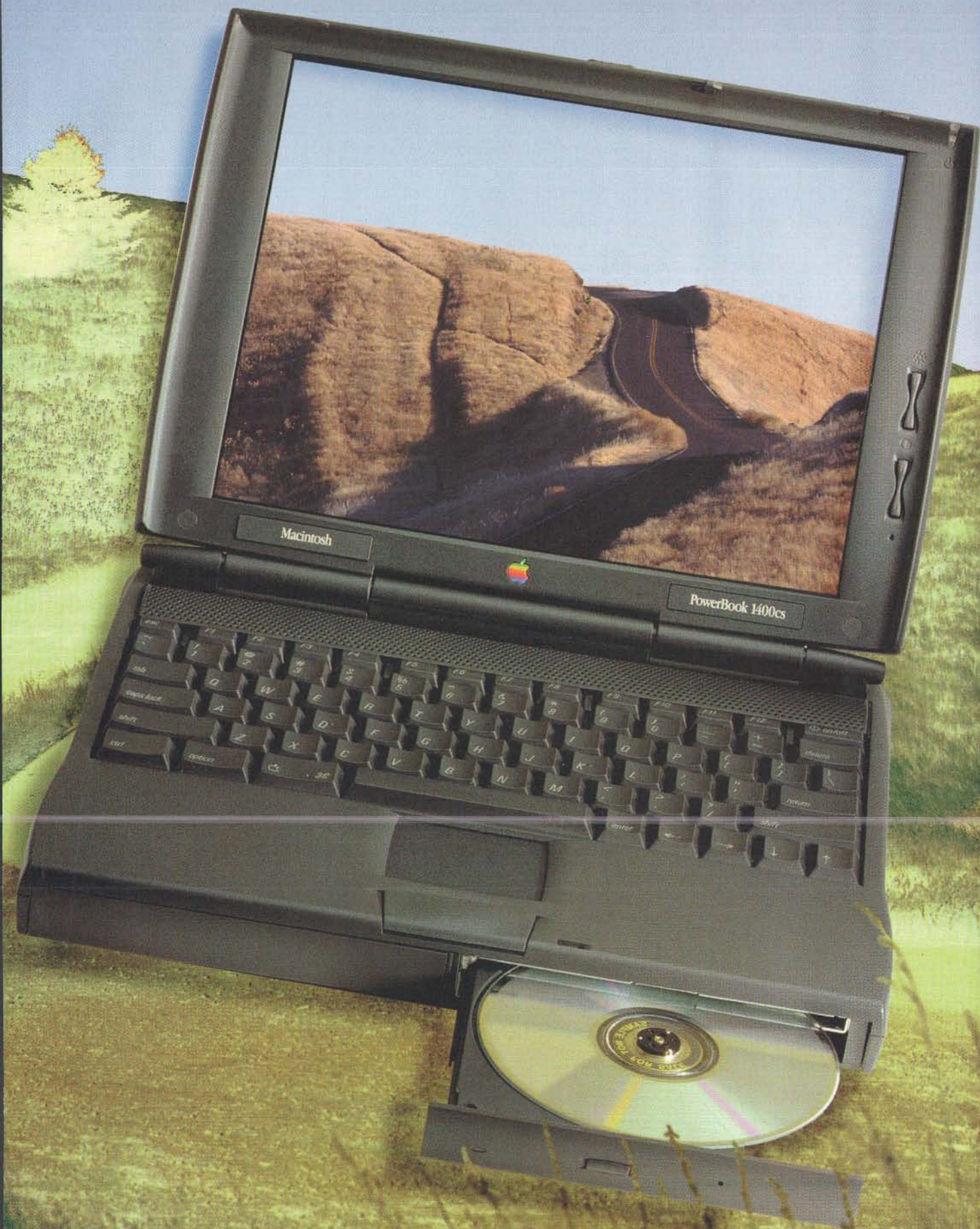


FEW PEOPLE WOULD DESCRIBE THE VOLVO as hotter than Georgia asphalt, but that doesn't make it any less desirable as a solid, reliable means of transportation. That's why we couldn't be happier, or more relieved, that after a month of road-testing the new PowerBook 1400 — Apple's first PowerBook since the troubled 5300 — we were reminded of the Volvo. Like Scandinavia's stalwart export, the 1400 won't break any speed records and it's not likely to set young hearts racing, but it is the kind of solid, reliable data vehicle we've all been waiting for from Apple.

1400

BY ANDREW GORE

PHOTO ILLUSTRATION: GIAMPIERO BENVENUTI



BOXY BUT GOOD

The most burning question we had regarding Apple's new PowerBook was this: Does it resolve the problems of its predecessor? Although it has been redesigned from the ground up, the 1400 is still based on the same logic-board architecture as the ill-fated 5300, so we were, of course, concerned.

We subjected the PowerBook 1400 to three kinds of reliability tests. First, we checked the durability of the hardware, using a series of nonlethal tests, including fieldstripping the unit down to its base components and subsequently reassembling it. Although we did not subject it to extreme conditions beyond Apple's stated operating limits — such as excessive heat, cold, or pressure — we did run limited versions of these tests within the recommended safe operating range of the 1400.

Second, we conducted an extensive series of software-compatibility tests, including installing many "suspect" applications and extensions that have been known to cause crashes with the 5300. Applications we tested included QuarkXPress 3.32, Photoshop 3.0.5, Illustrator 6.0, Word 6.0.1, Excel 5.0a, ClarisWorks 4.0v4, and FileMaker Pro 3.0v2, plus a variety of fax and communications software and CD-ROM multimedia titles. We also tested RAM Doubler 2.0 and Speed Doubler 1.3, both of which were previously linked to problems with the 5300.



APPLE POWERBOOK 1400c ★★★★★

PROS: Solid and reliable. Reasonably priced. Big screen. Many expansion options. Easy access for upgrading. Full-sized CD-ROM drive. Fashion-statement BookCovers.

CONS: Slow processor. Heavy, unremarkable chassis.

With the 5300, many problems didn't become evident until the machine had been in use for several weeks. So, we crammed months' worth of use into weeks of test time. In the month we had to test the 1400c model supplied by Apple, there was hardly an hour when it wasn't running some kind of test.

In the end, the PowerBook 1400 passed all our reliability tests. After trying every trick in the book to trip it up, the only problem we encountered was a minor screen flicker, which occurred when the portable was rapped sharply. The problem was later diagnosed as a loose connector.

FIRST IMPRESSIONS

So the 1400 appears to be unfettered by the reliability prob-

lems that plagued the 5300, but just because it's safe doesn't mean it's worth buying. We therefore looked beyond the machine's reliability to scrutinize its usability.

At first glance, the 1400 looks very similar to the 5300, but it appears larger. That's because the slightly bowed-out front section of the lower clamshell fools the eye — the 1400 is almost exactly the same size as the 5300, and, unfortunately, shares its boxy look.

Unlike the 5300, though, the 1400 has a couple of clever design tweaks that quickly distinguish it from run-of-the-mill PC portables. For example, there's a removable panel on the lid, called a BookCover, that can be replaced by

Spin-Doctoring the PowerBook 1400 / new portable CD-ROM drive

SINCE THE INTRODUCTION of Apple's PowerBook 5300, the most requested new feature, with the possible exception of machines that work, has been a 5.5-inch CD-ROM drive. With the 1400, Apple has finally delivered — on both of the requests.

The 1400's CD-ROM drive, also available separately for \$349, is a 6x mechanism manufactured by Teac. Not only is it Apple's first portable CD-ROM drive but it's also the company's first excursion into the world of ATAPI drives, which use an interface protocol that is a superset of the IDE interface standard common with PC portables.

The drive itself weighs about half a pound and slips into the 1400's drive bay on the right front of the portable. In testing the drive, we looked at compatibility, speed, impact on battery life, and usability. On all four counts, the drive passed with flying colors.

In implementing the new ATAPI drive interface, Apple really did its homework on compatibility. We tested over 30 CD-ROM-based applications and titles, ranging from the Microsoft Office CD-ROM to LucasArts' The Dig. All worked without a hitch. In fact, the only application that didn't work with the new drive

was MacBench 3.0, which couldn't recognize the ATAPI interface. As a result, we had to fall back on using the good old stopwatch for testing speed.

The new drive's speed was excellent, especially given that the speed of battery-powered CD-ROM drives has had a tendency to fluctuate wildly. Not surprisingly, the drive performed consistently at full speed while plugged in; however, even when battery-powered, the drive continued to perform well, with speed dropping off only slightly.

But the biggest surprise was how power-frugal the drive was. No matter what task we threw at it, the drive invariably ran for about two hours on battery power. Our tests included running multimedia titles that constantly access the disc and running audio CDs on a loop.

As for the usability of the module, the CD-ROM drive proved flawless. Like other modules, the drive can be warm-swapped — installed in the bay while the computer is sleeping. In all other ways, it behaves exactly like an internal CD-ROM drive in a desktop Mac, including having audio pass-through to the speakers. Apple has even thrown in a little bonus: a Control Strip module for controlling the playback of audio CDs. / ANDREW GORE

NO SPEED DEMON



AS A DATA VEHICLE, Apple's latest PowerBook isn't going to have to worry about getting any speeding tickets. It's equipped with a less-than-swift 117-MHz PowerPC 603e processor. That's disappointing, considering that 240-MHz 603e processors are currently available. Fortunately for those who crave the ultimate in speed, processor-

upgrade cards are slated to be available from Newer Technology.

MacBench 3.0 scores are relative to those of an Apple Power Mac 6100/60 with a 250-MB internal hard drive, which is assigned a score of 10 in each test. You can download a copy of MacBench from <http://www.zdnet.com/zdbop> or from CompuServe (GO ZDBENCH).

MACBENCH 3.0 SCORES

	Processor	Clock Speed	Processor	Floating Point	Disk Mix	Publishing Disk Mix	Graphics Mix	Publishing Graphics Mix
PowerBook 1400c	603e	117 MHz	12	16	13	9	7	9
PowerBook 5300c	603e	100 MHz	12	14	9	8	7	10
PowerBook 190cs	68040	33 MHz	5	0	12	8	4	4
Performa 6400	603e	180 MHz	19	24	20	15	14	11
			SCORE	BETTER	SCORE	BETTER	SCORE	BETTER

custom panels or by a clear-plastic panel. Laminated cards, decorated with colorful designs, can be slipped beneath the clear panel to give your PowerBook a distinctive look (see page 73 for *MacUser's* special BookCover cutout). In addition, Apple and several third parties plan to offer plastic replacement BookCovers with special finishes and designs (for more on BookCovers, see the "PowerBook 1400 Gadgets" sidebar).

When you open the 1400's clamshell lid, you see another innovation: an 11.3-inch, SVGA (800-x-600-pixel), 16-bit-color display. (Apple will no longer provide a grayscale option.) Apple is offering two versions of this big screen — a dual-scan, passive-matrix and an active-matrix display. Although we spent most of our time working with the 1400c, which sports the color active-matrix screen, we also had a chance to try out the 1400cs model's color dual-scan screen. Both showed just how far flat-screen technology has come in only a year — for example, the dual-scan screen exhibited almost no cursor submerging or motion blurring. The color saturation of both screen types has also improved, although the larger screen surface and higher resolution proved to be a challenge for the 1400's single lamp, making the screens less bright than the 5300's 10.5-inch display.

Overall, we preferred the sharpness and superior color of the active-matrix screen, although the new dual-scan screens have improved to the point where they give the active-matrix ones a run for their money.

ZONED FOR EXPANSION

A quick look at the 1400's innards shows that Apple's latest PowerBook was designed for maximum flexibility. In addition to the now familiar dual-card bay, which can accommodate either one Type III PC Card or two Type II Cards (all PCMCIA 3.2-standard), the 1400 is the first PowerBook to offer a full 5.5-inch front-loading storage-device bay. This bay can be used to store a spare battery or to accommodate a floppy, optical, Zip, or (drumroll please) full-sized 6x CD-ROM drive. Yes, at last it will be possible to use standard audio and data CDs in your

PowerBook. In fact, Apple is offering the CD-ROM drive in a bundle with two of the 1400's three configurations (for more on the 1400's CD-ROM drive, see the "Spindoctoring the PowerBook 1400" sidebar). All configurations come with a removable floppy drive.

A look at the rear of the PowerBook shows another, less obvious vista for expansion. There is still the infrared transceiver that debuted with the 5300. Unfortunately, it's just as slow as before and still isn't IrDA-compliant. (Apple's excuse for continuing to include this transceiver is that it costs next to nothing. If it's so cheap, we wish Apple had spent some money improving its speed or at least adding IrDA compliance.) More useful are the stereo-audio-in and -out ports, which are no longer hidden behind the port cover. And Apple has replaced the flimsy 5300 power connector, which had a tendency to break off, with the more solid Duo power connector. (The 1400 can't use a Duo power supply, however.)

Behind the port cover, which now swings under the ports to rest safely inside the case, are ADB, serial, and HDI-30 SCSI ports. There's also the 1400's internal expansion slot, which can accommodate a variety of cards, including an Apple video-out card or a Focus Enhancements 10BASE-T Ethernet card (for more on expansion cards, see the "Ethernet Ethos" sidebar).

UNDER THE HOOD

To appreciate why the 1400's expansion slot — virtually unchanged from that of the 5300 — is nevertheless a vast improvement, you have to look under the hood of Apple's new PowerBook. Although digging into a PowerBook has traditionally been a job best left to professionals, opening up the 1400 is almost as much fun — yes, fun — as using it.

Apple has finally learned its lesson. After years of building the most service-hostile portables on the planet, Apple has made the 1400 a dream to work on. Gone are the Torx screws, the tortured wireworks and subframes, and the delicate connectors that can short out or snap off at the least provocation. It takes under three minutes to access

EASY THREE-STEP ACCESS



STEP 1. The 1400 is the first PowerBook to have elements that snap, Lego-like, into place. The grille over the keyboard pops off when you give a firm push to the left.



STEP 2. No screws anchor the 1400's keyboard, so once the grille has been removed, the keyboard lifts out with a little upward pressure from a slotted screwdriver.

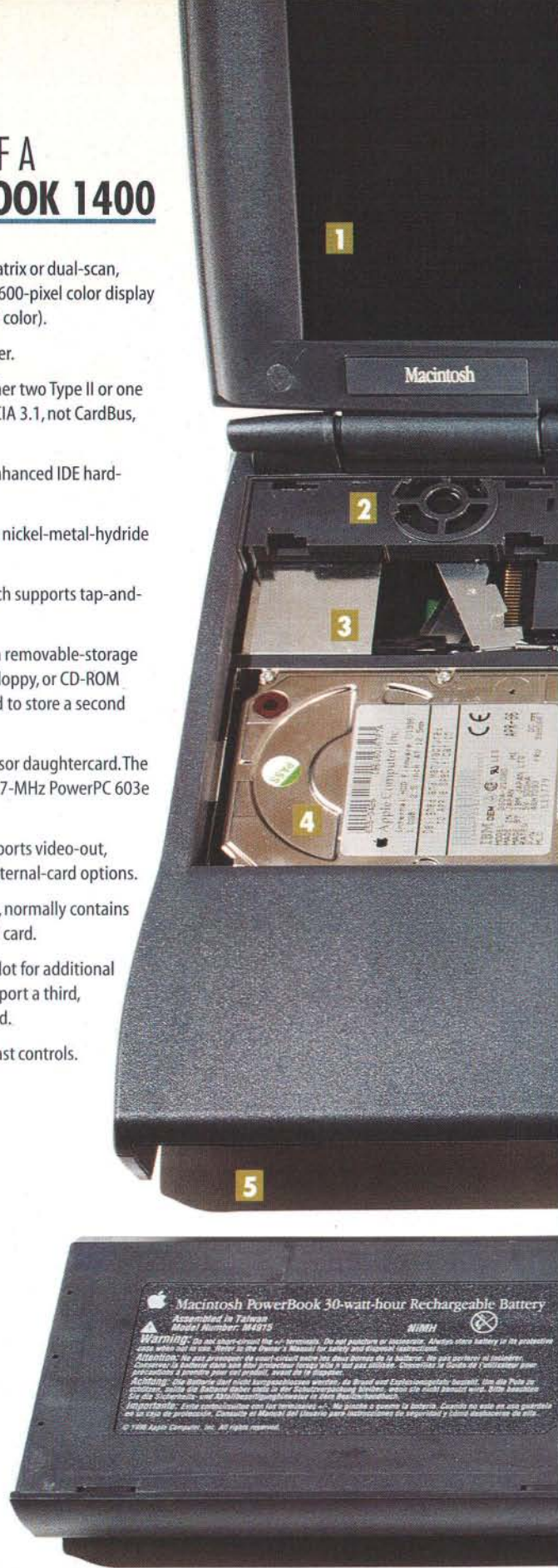


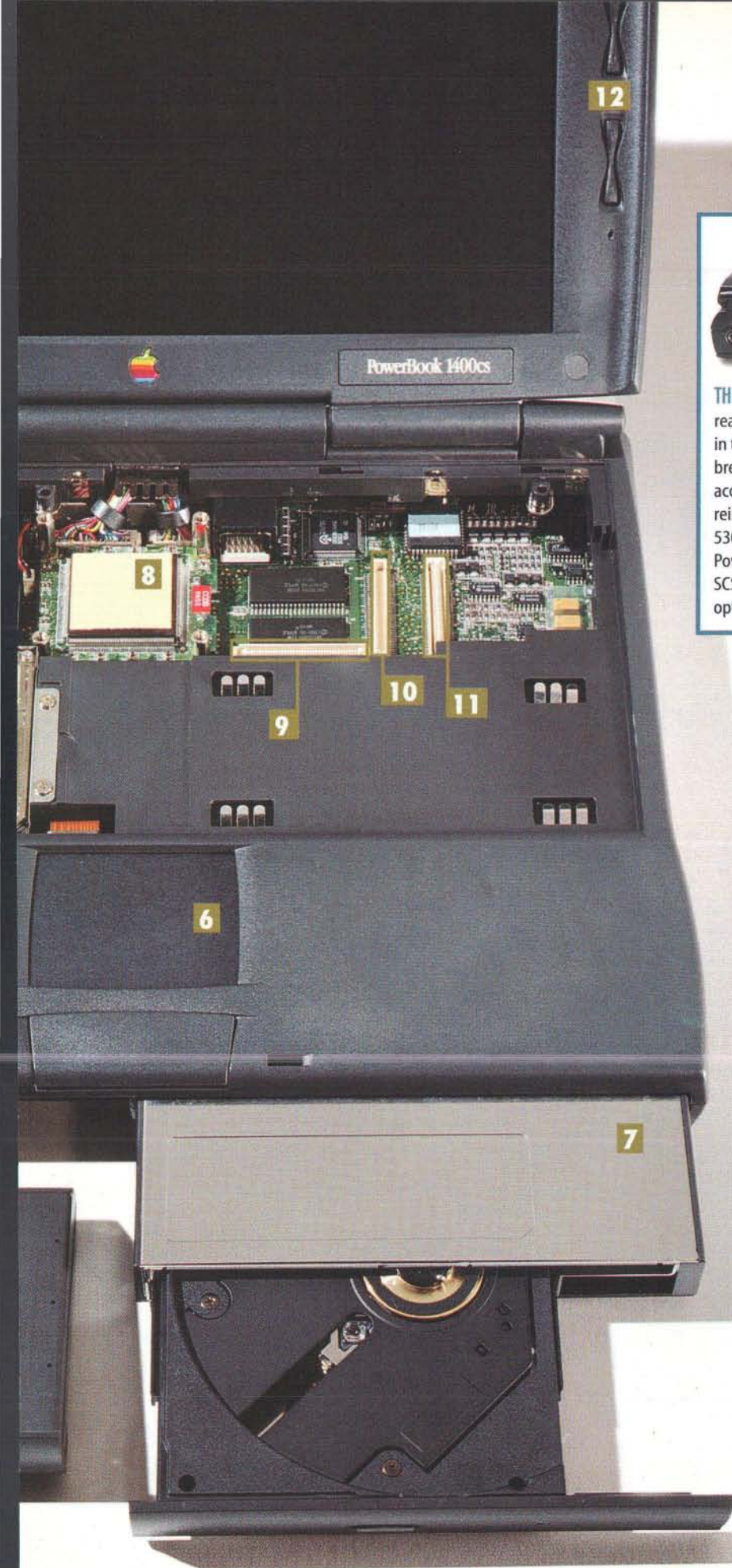
STEP 3. With the keyboard out, remove eight screws (two for the hard drive, six for the heat sink) to get at the 1400's primary components. Unlike past PowerBook models, the 1400 uses garden-variety Phillips-head screws, not the more exotic Torx screws. Once the screws have been removed, all user-upgradable parts are easy to access.

ANATOMY OF A POWERBOOK 1400

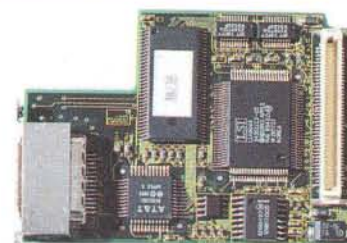
1. 11.3-inch active-matrix or dual-scan, passive-matrix 800-x-600-pixel color display (supports up to 16-bit color).
2. Monophonic speaker.
3. PC Card bay for either two Type II or one Type III PC Card (PCMCIA 3.1, not CardBus, interface).
4. Internal 2.5-inch Enhanced IDE hard-drive bay.
5. Battery bay for one nickel-metal-hydride (NiMH) battery.
6. New trackpad, which supports tap-and-drag functions.
7. Expansion bay for a removable-storage device, such as a Zip, floppy, or CD-ROM drive; can also be used to store a second battery.
8. Upgradable processor daughtercard. The 1400 comes with a 117-MHz PowerPC 603e and no L2 cache.
9. Expansion slot supports video-out, Ethernet, and other internal-card options.
10. Primary RAM slot, normally contains factory-installed RAM card.
11. Secondary RAM slot for additional memory. Can also support a third, piggybacked RAM card.
12. Brightness/contrast controls.

PHOTOGRAPHY / STEVEN UNDERWOOD





THE 1400 OFFERS several enhancements to the PowerBook rear panel. A metal-hinged port cover is partially contained in the portable when the cover's open, making it harder to break off the cover. The audio-in and -out ports are now accessible even when the port cover is closed. The Duo-style reinforced power connector is a vast improvement over the 5300's fragile power port. The familiar, if limited, selection of PowerBook ports is available — single ADB, serial, HDI-30 SCSI, security, and infrared ports. There's also an area for an optional internal video or Ethernet port.



THE POWERBOOK 1400 is Apple's most expandable PowerBook yet, with several Apple and third-party expansion cards available for its three internal slots. An Apple video-out card (top), a Focus Enhancements 10BASE-T Ethernet card (middle), and an Apple RAM card (bottom) are just a few of those available.

all the major components of the 1400. And the tools you need are no more exotic than a standard Phillips-head screwdriver (for a guide to fieldstripping your PowerBook, see the "Anatomy of a PowerBook 1400" sidebar).

Once you've removed the keyboard, you have easy access to the internal hard drive, the expansion slot, and the two RAM slots. To expand the system's memory, you don't have to replace the factory-installed RAM card. The second RAM slot can accommodate up to two RAM cards, via a piggyback connector. With three cards installed, the 1400 can have up to 64 MB of RAM.

The combination of the PC Card bay, removable-storage-drive bay, internal expansion slot, and two RAM slots makes the 1400 Apple's most flexible and expandable portable to date.

YOUR FATHER'S OLDSMOBILE

In addition to the plethora of slots, the 1400 also sports another place into which an add-on card can be plugged: the processor-daughtercard connector. The 1400 is the first of the PowerBooks since the 500 series to offer an upgradable-processor option — a good thing, considering that the 117-MHz PowerPC 603e Apple ships in its

new PowerBook is a little sluggish by today's standards.

The 1400 achieved a MacBench 3.0 Processor score of just 12, as did the 5300c, with its 100-MHz 603e. Part of the reason for the low score is the 1400's lack of a Level 2 cache. The speed problem is compounded by the 1400's 33-MHz, 32-bit-wide bus, which is slower than that of even the slowest Performas now available.

Considering that 603e processors are now available at speeds of up to 240 MHz, Apple's choice of the relatively slow 117-MHz 603e chip seems almost unforgivable, except for two things: today's complete selection of PowerPC-native applications and the company's use of a fast, Enhanced IDE drive. Using native software, we found the 1400's speed acceptable and noticeably faster than that of our 5300c running the same applications.

For those who just can't take driving in the slow lane, Newer Technology plans to offer a full line of processor-upgrade cards for the 1400. All these cards will come with a 128K L2 cache and faster processors, possibly with speeds as high as 200 MHz.

Another area in which the 1400 disappoints is in its heftiness. It weighs in at 6.6 pounds with the floppy drive installed and 6.9 pounds with the CD-ROM drive installed

PowerBook 1400 Gadgetry / accessories are everything

NO SELF-RESPECTING POWERBOOK JOCKEY would want to miss out on the nifty gadgets that enable, enhance, and enliven PowerBook 1400 computing. Apple has been working with several third-party developers to ensure that owners of its new PowerBooks will have plenty of goodies to cram into their briefcases — or their PowerBook's expansion slots. Vendors were still finalizing prices as we prepared this article and details on configurations were sketchy, but here's a general rundown on what PowerBook 1400 owners can look forward to.

COVER STORY. The most visible add-on for the 1400 is the BookCover, a custom lid that lets you personalize your PowerBook. To give your 1400 a distinctive look, you have several options. You can replace the 1400's plain-gray plastic panel with a transparent one (both are included) and then slide a printed design — made of laminated card stock — behind it, or you can purchase a custom-designed plastic lid.

The 1400 comes with a selection of card-stock designs cut to fit behind the transparent BookCover, or you can create your own designs, using Apple-supplied templates. In addition, Apple will be promoting a variety of special BookCover "lines" designed to project your personality, promote your business, or even add functionality to your PowerBook.

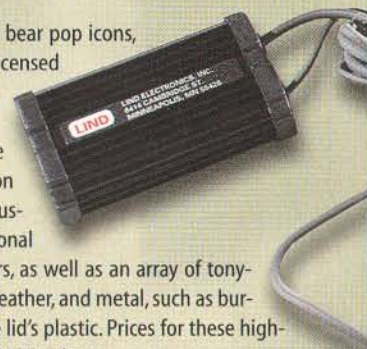
Although details weren't finalized as we prepared this article, Apple's plans call for four distinct kinds of custom plastic BookCovers. A mass-market line,

priced at about \$20 per BookCover, will bear pop icons, such as college or sports-team logos or licensed characters. A vanity line will bear the names or logos of companies, products, or special events. A signature-edition line will target collectors with limited-edition designs created by celebrity PowerBook users. And a prestige line will feature functional add-ons, such as foldout stereo speakers, as well as an array of tony-looking materials, including fine wood, leather, and metal, such as burnished aluminum, incorporated into the lid's plastic. Prices for these high-end BookCovers could range as high as \$125 apiece.

One prestige-line cover has already been finalized, and it's sure to intrigue the perennially battery-drained: Keep It Simple Systems is building a BookCover with a built-in flip-out solar panel the company claims will run your PowerBook and/or recharge your battery whenever you work in sunlight — even through a window.

JUICING UP. Along more-traditional portable-power lines, VST Technologies will supply a new version of its Smart Charger for the PowerBook 1400's nickel-metal-hydrate batteries. The Smart Charger uses Apple's AC adapter as its power source. You'll be able to buy it with or without

the adapter and an extra battery. According to VST, batteries will refresh far faster in the Smart Charger than they do in the PowerBook, since the Smart Charger delivers 2.0 amps of charge current whereas the PowerBook's internal charge circuitry delivers just .75 amps.



instead. Although about half a pound lighter than the 540c, it is still a dense machine in a market in which portables are getting both smaller and lighter.

One nice thing about a larger portable, however, is that it has space for a full-sized keyboard. In addition to having the crisp action we've come to expect from PowerBook keyboards, the 1400's keyboard is raised, not recessed like the 5300's — which makes for a more pleasant typing experience. Also, because the keyboard rests on a flat panel that supports its entire area, you don't experience the spongy feeling that sometimes afflicts keyboards on subnotebooks such as the Duo. It also has a full palm-rest area with a centered trackpad that boasts double-tap and tap-and-drag capabilities. If you have trouble mastering the trackpad's tap-and-drag functions, as we did, you can turn them off via the Trackpad control panel.

YOUR MILEAGE MAY VARY

One thing that could have shaved ounces, if not pounds, off the 1400 would have been the use of lighter, lithium-ion (LiIon) batteries. Considering Apple's past problems with the more volatile LiIon technology and the 5300, however, the company was perhaps wise to go with nickel-

metal-hydride (NiMH) batteries for the 1400.

Certainly, the 1400's battery life doesn't seem to have suffered from use of NiMH power packs. Apple claims that the 1400 can run for 2 to 5 hours on a single, fully charged battery. Although our test results don't quite bear out these optimistic estimates, they come close. In repeated tests with a variety of power configurations, ranging from maximum conservation to power hog, the 1400 ran on a single battery for anywhere from 1 hour, 45 minutes to as long as 4 hours. We consistently got 3 hours' use by using only moderate power-conservation measures and 2 hours' use if we accessed the CD-ROM drive frequently (for more on the CD-ROM drive's impact on power consumption, see the "Spin-Doctoring the PowerBook 1400" sidebar).

The 1400's battery, which fits in a compartment next to the removable-drive bay, is quite compact — you can probably fit two batteries fairly easily into a tightly packed PowerBook bag. Because the 1400 has a built-in 50-milliamp-hour, rechargeable lithium backup battery, users can put the PowerBook to sleep and exchange batteries without fear of losing whatever is stored in RAM or in a RAM disk.

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Mobile PowerBook users will be able to plug Lind Electronics' AC adapter into their car's cigarette-lighter socket.

DATA LUGGAGE.

Like that of the PowerBook 5300 series, the PowerBook 1400's expansion bay can accommodate a variety of third-party storage devices. VST leads the pack, with a range of hard-drive and removable-cartridge-drive options. VST has announced plans for expansion modules built around the Iomega Zip drive and the Fujitsu DynaMO 230 3.5-inch magneto-optical drive. VST also plans to offer a 1-GB hard drive before the end of this year as well as 1.2- and 1.6-GB hard drives sometime in early 1997.

As we went to press, Fujitsu still hadn't committed to offering a DynaMO expansion module of its own for the 1400, but it does plan to offer an external version of its 3.5-inch magneto-optical drive. The \$499 device will connect to the PowerBook via the PC Card slot.

NETWORKING. In addition to the PC Card Ethernet adapters already available for PowerBooks, 1400 owners will have at least two internal Ethernet cards to choose from: the \$129 Focus Enhancements EtherLAN 1400 and the Newer Technology PowerBook 1400 Internal Ethernet Card. The cards will feature RJ-45 connectors and compatibility with both classic EtherTalk and Open Transport.

THERE'S MORE. The Newer Technology PC Card Video-In Capture Card for the 1400 will grab video at 8 to 30 frames per second, at resolutions of up to 320 x 240 pixels. Included software will let you use a video camera to either take still pictures or create time-lapse movies. You will even be able to use the camera in motion-detector mode — it will snap shots only when there's movement in front of the lens.

A BookEndz docking station, from Pilot Technologies, will provide connections for a desktop monitor, networking, and a modem. / JIM SHATZ-AKIN



THE BOTTOM LINE

PowerBook 1400 is something of a misnomer, considering that the computer's model number is lower than that of the 5300. In every way, it stands head and shoulders above its predecessor — it's solid, it's reliable, and it has everything we could possibly ask for in a basic portable. Although its speed didn't blow us away and it lacks the raw animal magnetism of the 500 series, the 1400 delivers more value than any of its forebears. In fact, it gave us the same kind of satisfaction we got from using the original 100-series portables. Unlike the 5300 and 500 series, the 1400 series is priced right, and as a result, it may attract 100-series buyers who didn't go for Apple's pricier alternatives.

Apple is offering its new portable in three configurations. At the low end, the 1400cs has a dual-scan, passive-matrix display, a 750-MB drive, and 12 MB of RAM and costs only \$2,499. The second 1400cs configuration comes with a 750-MB drive, 16 MB of RAM, and a CD-ROM drive, for \$2,899. At the high end of the line is the 1400c, which sports an active-matrix display, a 1-GB

drive, 16 MB of RAM, and a CD-ROM drive, for \$3,499. Each configuration comes bundled with the Apple Internet Connection Kit, ClarisWorks, Claris Organizer, and PowerBook File Assistant, plus several other utilities. All in all, the 1400 offers a good range of configurations at reasonable prices. It's a solid value, especially when you consider how many of its features are new.

But it's not just reliability and competitive pricing that make the 1400 a proper heir apparent to the PowerBook throne — it's also creative flair. Although we know that it won't help the processor run any faster (we've already ordered upgrades to take care of that), the wood-grain BookCover we've got on order is going to add a dash of elegance to our mobile-computing experience. Now we just wish we could afford a Volvo with wood paneling.

Best of all, though, is that the 1400 makes it safe once again to buy a PowerBook. And given its bigger screen, CD-ROM drive, and better overall design, buying a PowerBook 1400 is not only safe but it's maybe even a good idea as well. ☺

Andrew Gore is editor of *MacUser* and coauthor of *PowerBook: The Digital Nomad's Guide*. He also wrote the first review that exposed the problems with the 5300 series. Senior Editor Jim Shatz-Akin also contributed to this report.



BOOKMARK

RELATED INTERNET SITES

● Apple's PowerBook Resource Center
Everything the road warrior needs to know about Apple's new portables.

GO TO <http://www.zdnet.com/macuser/features/pb1400.html>

Ethernet Ethos / connecting the PowerBook 1400

NO MATTER HOW FECKLESS, unfettered, and free your PowerBook allows you to be, there's sure to come a time when you'll need to connect to a network. These days, of course, that means Ethernet — and with the PowerBook 1400, it also means an additional purchase. That's because Apple hasn't offered built-in Ethernet with its PowerBooks since the 500 series, so you'll need to buy either an internal Ethernet adapter (Focus Enhancements and Newer Technology are both selling them) or a PC Card LAN adapter.

Using a PC Card LAN adapter will be your *only* option if you also need video-out capabilities from your PowerBook 1400, which has only one internal expansion-card slot. You can use the slot to accommodate either a video adapter or an Ethernet card. If you opt to do the former, you'll need a PC Card for your Ethernet connection. You can choose a single-purpose LAN card or a combo card, which does double duty as both a modem and a network interface.

Which is right for you depends on a variety of issues, including, of course, your need for speed. If you'll be connected to a network frequently or if you plan to move large files from your PowerBook to other machines via a LAN, speed will be paramount in your purchasing decision.

To help you get an idea of what you can expect in terms of speed, we used ZDBOP's NetBench NIC (network interface card) test, which measures the peak throughput of NIC cards, to evaluate a

sampling of the PC Card Ethernet adapters currently available for PowerBooks. Because not all applications request that a file be transferred in the same packet sizes, the test uses a 10-MB file that is requested by the client from the server in varying packet sizes.

We tested two combo cards — the \$499 Global Village PowerPort Platinum Pro and the \$499 Farallon LAN/Modem PC Card — as well as the \$169 Farallon EtherMac PowerBook PC Card, a dedicated Ethernet-only card. We compared each card's speed with that of a PowerBook 520's built-in Ethernet.

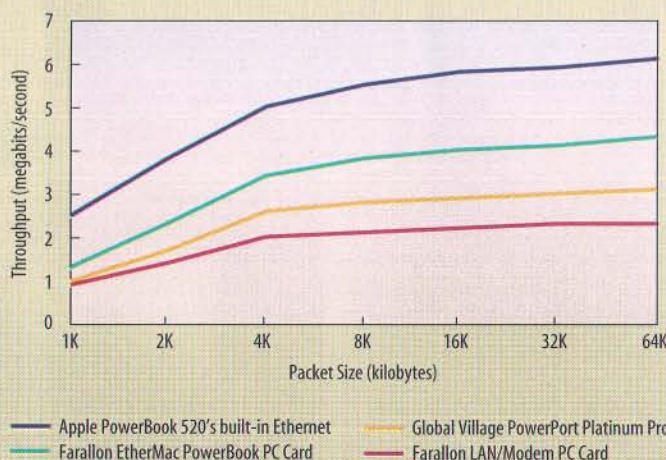
Our findings (see figure) suggest that a single-purpose networking PC Card is faster than a combo PC Card — potentially by 50 percent. However, PC Cards in general lag far behind built-in Ethernet, which is up to 50 percent faster than the fastest PC Card we tested, Farallon's Ethernet-only EtherMac PowerBook PC Card.

In addition, as you might expect, all combo cards are not created equal — the Global Village PowerPort Platinum Pro consistently beat the Farallon LAN/Modem PC Card in our tests.

There's more than raw throughput to consider when you choose a PowerBook networking card. Price is important, as is convenience. A single combo card may be easier to keep track of than two dedicated cards — one modem and one networking PC Card. But for top speed from a networking PC Card, a single-purpose adapter is your best bet. / JIM SHATZ-AKIN



THROUGHPUT VERSUS PACKET SIZE



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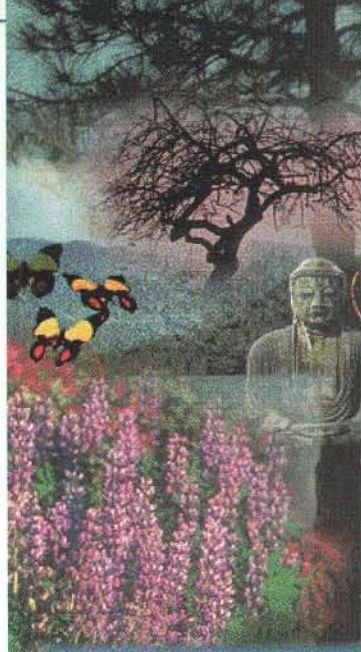
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Canon
CIRCLE 9 ON READER SERVICE CARD



IT GETS TOUGHER EVERY YEAR. Back when the titles were few enough, we could actually use our annual CD-ROM roundup to pick the best 50 of all the CD-ROMs you could buy for the Mac. Now, we're limiting ourselves to the best ones released since our last roundup (October '95), but the task is more Herculean than ever. Even with some companies not responding to our call for titles, we still looked at hundreds of discs — and the best ones are better than ever before.

So, we've gotten tougher as well. We've upped the ante on quality, insisting that only those titles rating four mice and above (based on our



TOP 50

judgment of their content, production quality, ease of navigation, innovative features, and overall enjoyability) make the final cut. We also favored titles with broad audience appeal over niche-y products. And of course, as in past years, we excluded products that use CD-ROMs simply as delivery media for applications (such as Adobe Photoshop and Microsoft Office) or for collections of individual items (clip art, fonts, photographs, shareware, and so on).



The result is a list of titles we consider the Olympic medalists of the current crop of CD-ROMs. As in the Olympics, our finalists are grouped within categories; although we don't offer gold, silver, or bronze designations, we do list by mouse rating (and alphabetically within groups of equal mouse ratings). There's no flame to ignite, but you can go ahead and start playing your John Williams Olympic Fanfare CD now, because it's time to summon the heroic ones . . .

BY THE EDITORS OF *MACUSER*





CD-ROMs

Reference

Microsoft Bookshelf '96 - '97

Microsoft / 44444; \$55 estimated street

You can look through nine cross-linked reference works all at once or individually for great quotes, definitions, URLs, ZIP codes, or just ideas. This program brings together a dictionary, thesaurus, almanac, dictionary of quotations, encyclopedia, chronology, ZIP-code directory, world atlas, and Internet directory, with a single search engine. If you can afford only one reference resource, this is the one you want.

Cinemanía '96

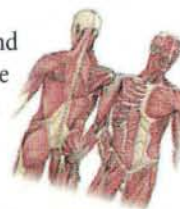
Microsoft / 44444; \$35 estimated street

Want to find the 1996 Academy Awards nominees, see a picture of Brad Pitt, or hear some dialogue from *Double Indemnity*? Providing everything from biographies and filmographies to movie reviews and film recommendations in a variety of categories, this program is the best CD-ROM movie guide you can buy. To boot, monthly online updates will keep you hip to the latest film news.

AMA Family Medical Guide

DK Multimedia / 44444; \$39.95 list

Alas, there are no keen transparent layers to flip through with this program's anatomy charts, but you *can* flip among topics ranging from childbirth to the hazards of alcohol abuse — thanks to a generous smattering of hyperlinks, supplemented with videos and animations. Hypochondriacs will love the ability to self-diagnose their ills through symptom-based flowcharts.



MarketPlace 3.0

MarketPlace Information / 44444; \$600 estimated street

If you do any direct marketing, the investment you make in this admittedly pricey program will pay off. MarketPlace 3.0 provides access to quarterly updated Dun and Bradstreet information on all U.S. businesses. Cross-reference the data by business location, size, type, and other criteria for an unlimited amount of market analysis, and then use the data to create a fine-tuned mailing or telemarketing list of up to 3,000 prospects. If you like the results, you can buy more prospects from MarketPlace.



TOP 50 CD-ROMs

Microsoft Encarta '96

Microsoft / ; \$55 estimated street

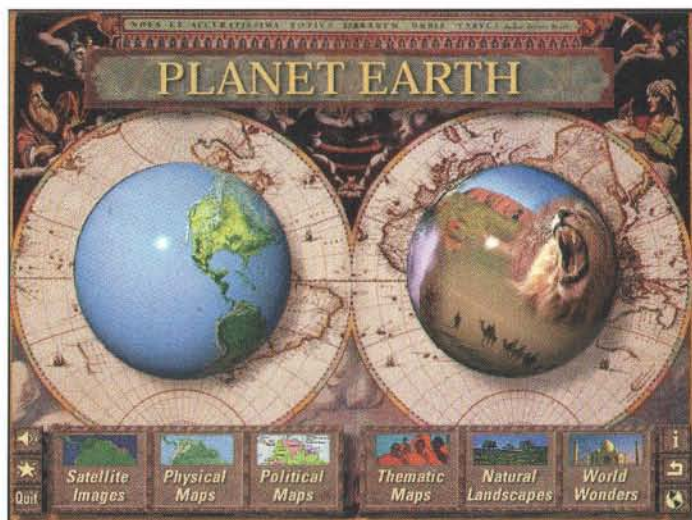
Information grazers will love this explorative encyclopedia, which encourages you to, for instance, compare languages with one another or match musical instruments with their country of origin. Of course,

you can read individual articles on encyclopedia topics, but it's more fun to have Encarta's Mind Maze trivia game test your knowledge first or let yourself get sidetracked with the article's many links. It's just too bad the poorly ported interface puts Mac users at a disadvantage.

**Planet Earth**

Macmillan Digital USA / ; \$49.95 list

If you want maps, Planet Earth's got 'em. In fact, it has six sets of maps, including satellite views, political boundaries, ecological zones, and famous historical sites. Find a spot on any map that interests you, and then uncover information about it. Although the information is similar to what you'd find in an encyclopedia, this CD-ROM is not dry — slide shows, video clips, and voice-overs keep the learning lively.

**Real Picture World Atlas**

Now What Software / ; \$49.95 list

From Albania to Zimbabwe, this atlas will take you all over the world, give you geopolitical information and statistics on each country, and let you hear the local language. When you click on a country, a list of common American English phrases appears — select one, and you'll hear its equivalent in that country's most common tongue. As they'd say in Australia, it's "magic."

SelectPhone 1997

Pro CD / ; \$99 list

Directory assistance was never like this.

You can search for people by name or find businesses by classification code, but that's not all. With this title, you can also target listings by their distance from your home or business and quickly get the names and numbers of neighbors — a handy option for when emergencies arise. If you're not sure of the exact name or location, just use the clever search feature to look through similar names and nearby towns.

**Street Atlas USA 3.0**

DeLorme / ; \$80 estimated street

Whether you need to find your way around a large city or travel to one of the more remote corners of the U.S., this program has the street maps to get you there. New features include an overview window that lets you know where you're searching (the zoom and search functions remain awkward, though).

MORE THAN MUSIC

TAKE A COLLECTION OF SONGS and mix in material reminiscent of *Entertainment Weekly*, *Cosmopolitan*, MTV, *Doom*, *Tiger Beat*, and *People* magazine, and what do you get? The record industry's new kid on the block: the Enhanced CD. On a single compact disc, music companies are adding photos, music videos, games, lyrics, and just about anything else that will "enhance" the buyer's experience. The roster of artists jumping on the bandwagon is diverse, ranging from Bonnie Raitt and Natalie Merchant to Primus and Queensrÿche.

With the definition of this new art form still up for grabs, it's hard to predict where the best Enhanced CDs will turn up. Niches such as contemporary Christian music can provide surprisingly good examples of the Enhanced CD's potential, whereas those from some major artists have been ho-hum.

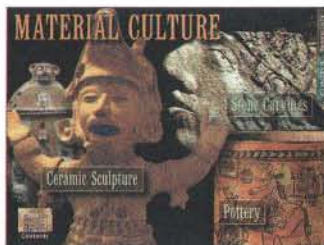
Here are ten Enhanced CDs, running the gamut of musical genres, that all truly deserve to be called "enhanced." In general, they offer attractive interfaces plus lots of photos, interviews, music videos (most with lyrics), and games — not to mention the occasional surprise or two. In one of them, watch out where you aim that rock . . . / LAMONT RIDGELL

History

Exploring the Lost Maya

Sumeria / ; \$49.95 list

If Indiana Jones became a multimedia publisher, the result might look a bit like this: a title that manages to entertain as it reveals the secrets of Mayan culture.



You'll explore archaeological digs, learn how to read Mayan hieroglyphs, extrapolate the decline of the great empire, and see gruesome Mayan rituals — you can even get travel information in case you want to visit the sites yourself.

Critical Mass: America's Race to Build the Atomic Bomb

Corbis Publishing / ; \$49.95 list

World politics, nuclear physics, personal tragedy, and Atomic Age comic-book excerpts fuse together at a Los Alamos office, circa 1945. Discover the motives and history of the atomic bomb's masterminds, including J. Robert Oppenheimer and Niels Bohr; tour 1940s Los Alamos; and learn about the making and marketing of the Atomic Age and the Cold War.

The Day After Trinity

Voyager / ; \$29.95 list

The brilliant physicist who masterminded the creation of one of mankind's deadliest weapons and helped the Allies win World War II was also one of the most poignant victims of the Cold War. This annotated film documents J. Robert Oppenheimer's life, including his motivations for making the atomic bomb and his disgrace during the McCarthy era, and includes declassified files about Oppenheimer as well as a photo gallery of haunting images.



Kon-Tiki Interactive

Voyager / ; \$39.95 list

Risking his life, anthropologist Thor Heyerdahl took to the Pacific Ocean in a handmade balsa raft in 1947 and conclusively proved that ancient cultures migrated between distant islands and continents. You can meet up with the great adventurer and his journeys through his documentaries, books, and archaeological digs — in fact, the indefatigable Norwegian will even pop up in your explorations on this CD-ROM, whenever he has a new anecdote to share.

/ ten truly enhanced CDs

BORN ON A PIRATE SHIP

— Barenaked Ladies (Reprise Records)

Tongue-in-cheek lyrics go hand in hand with the offerings of this interactive extravaganza. Just have some fun with this one.

BURNING DOWN THE HOUSE

— Bonnie Raitt (Capitol Records)

The concert video sequences alone are worth the price of this straight-ahead rock-and-roller's latest offering.

GO BIG

— Various Artists (Om Records)

No PC game on the market captures the energy and excitement of snow- and skateboarding as well as this CD does with its videos, music, and supplements from *Slap* and *Thrasher* magazines. If you ride fast and play your music loud, make this your soundtrack.

THE GROOVEACTIVE COLLECTION

— Various Artists (Om Records)

This CD challenges some of the best music-related CD offerings from Voyager — and surpasses some of them. Great graffiti art, acid jazz, and interviews.

THE INDIVIDUALIST

— TR-i (lon)

The best yet from the artist formerly known as Todd Rundgren; it features a retro-'50s interface and catchy pop songs tied to off-the-wall animations and activities (imagine Rush Limbaugh meets Doom).

JESUS FREAK

— D.C. Talk (Forefront)

The interactive videos and interviews are just as frenetic as the music. Hip-hop-contemporary-soul-Christian-rap music doesn't get any better than this. Some of the goodies on the "enhanced" side will surprise even the jaded.

LIMBOLAND

— Betty (Intersound)

Learn how this three-woman rock band went from the small-club circuit to HBO's *Encyclopedia*, through interviews, videos, and other extras.

OL' SCHOOL

— Ohio Players (Intersound)

A live-in-concert CD full of the eye-popping visuals you'd expect from this group, known for its double-entendre titles.

PART OF THE SYSTEM

— Dana Key (Forefront)

A slick, clean interface makes this contemporary-Christian CD as easy on the eyes as it is inspiring to the ears.

TELECOMMUNICATIONS BREAKDOWN

— EBN / Various Artists (TVT Records)

Put this disc into your drive, and witness what MTV is supposed to be, as your screen becomes an interactive-video wall. Artists from Gil Scott-Heron to Nine Inch Nails contribute.



150 Years of America's Smithsonian

Macmillan Digital / **★★★★**; \$39.95 list

The Smithsonian Museum is a treasure trove of memorabilia and art. This title can't match the museum's collection item for item (an impossible task for one CD-ROM), but thanks to an interactive time line and a Find feature, it's easier to navigate than the real museum — plus you get multimedia supplements such as a film clip from *The Wizard of Oz* that's linked to a picture of Dorothy's red slippers.



Ten DESERT-ISLAND DISCS

ALTHOUGH WE'RE ALWAYS on the lookout for great new titles, these still-available classics would be good company for any desert-island sojourn (with a PowerBook 1400 and a solar-battery pack, of course).

THE COMPLETE MAUS — Voyager

COSMIC OSMO AND THE WORLDS
BEYOND THE MACKEREL — Cyan

A HARD DAY'S NIGHT — Voyager

MICROSOFT WINE GUIDE — Microsoft

MYST — Brøderbund Software

PASSAGE TO VIETNAM — Against All Odds

SMALL BLUE PLANET — Now What Software

THE THINKIN' THINGS COLLECTIONS — Edmark

THE WAY THINGS WORK — DK Multimedia

XPLORA 1 — Interplay Productions

Science and Nature

Volcanoes: Life on the Edge

Corbis Publishing / **★★★★½**; \$49.95 list

Volcanoes is a natural wonder. Packed with drama and captivating imagery, this disc lets you explore the phenomenon of the volcano through the perspective of *National Geographic* photographer Roger Russmeyer. Start by viewing vivid photographs of the world's volcanoes while listening to stories about them, and then delve deeper into volumes of supplemental information. There's much to explore, and the well-organized interface makes everything easy to find.

A.D.A.M. The Inside Story 1997

A.D.A.M. Software / **★★★★**; \$39.95 list

Like a '90s version of the '60s clear-plastic dolls with removable body parts, this disc is an excellent amateur tool for boning up on anatomy. You can magnify the view of each body part; flip through over 60 virtual



overlays; and manipulate 3-D models of the lungs, heart, and skull. One particularly valuable feature is the Scrapbook, a well-designed series of stories intended to teach children about various body systems, such as the reproductive and lymphatic systems.

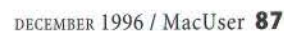


In the Company of Whales

Discovery Channel Multimedia / **★★★★**; \$39.95 list

If you're planning a whale-watching trip or you're just a fan of the world's largest mammal, this CD-ROM is an excellent resource. It's packed with facts and footage on our blubbery friends of the ocean. Learn where whales hang out and what they do that we can't see beneath the water, and get insight from a panel of experts who answer frequently asked whale questions.







ArtRageous!

SoftKey / ★★★★★; \$40 estimated street

If you can deal with digital host Tim and overlook the rather obnoxiously designed central Plaza, ArtRageous! hides lots of fun stuff for kids as well as adults to goof around with. Sections labeled Perspective, Light, Composition, and Color house interactive games that let you mess with famous artwork and create your own while boning up on art techniques and a little art history.

Between Earth and the End of Time

Integrated Communications & Entertainment / ★★★★★; \$59.99 list

Fans of Welsh artist Rodney Matthews' otherworldly art will enjoy this CD-ROM "journey" hosted by Matthews himself. Addressed as Traveler, you peek into his studio, leaf through digital portfolios, and take a walk through the Welsh countryside. Word puzzles and quizzes accompany your tour. The CD-ROM also includes a workshop where, provided with an assortment of backgrounds and fantasy creatures, you can dabble in creating your own Matthews-like art.

Charlton Heston's Voyage Through the Bible / Old and New Testament

Jones Digital Century / ★★★★★; \$39.95 list

Charlton Heston may not be your cup of tea, but at least he picks colorful material to work with. This 2-CD-ROM trip through the Bible's history is smooth and tasteful, an interactive Near Eastern tour through a 3-D temple, art and music history, and archaeological sites. Video clips of Heston as Mr. Rugged Man, tooling around the desert in his Jeep, are simply an amusing cherry on top of this scenic sundae.

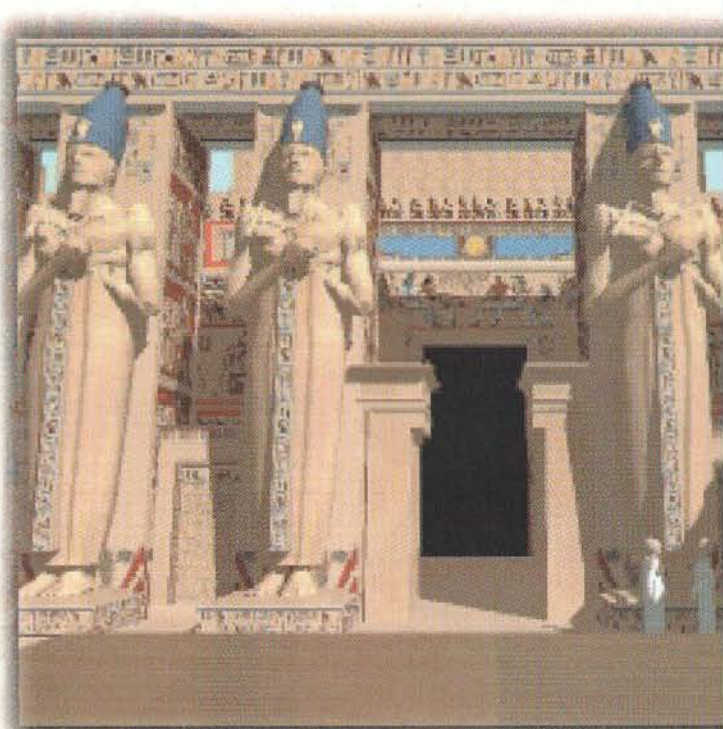


Masterpiece Mansion

Philips Media / ★★★★★; \$40 estimated street

Billed as a children's CD-ROM, Masterpiece Mansion is nonpatronizing and diverting enough to entertain adults as well. Trapped in a mansion, you cruise through rooms and try to escape by clicking on paintings, answering questions, and solving puzzles that draw on your knowledge of art history. You are assisted by artist

biographies, time lines, and synopses of art periods through the ages. Although a lean overview of art history, it's still plenty of fun.



Poetry in Motion II

Voyager / ★★★★★; \$29.95 list

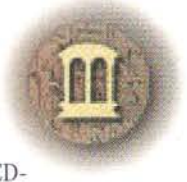
Poetry fans who understand that many poems are best read aloud will appreciate this second volume of Voyager's "live" poetry showcase. Watch and listen to performances from 24 North American poets — among them Jim Carroll, Allen Ginsberg, Anne Waldman, Helen Adam, and Spalding Gray — and follow along with attached transcripts. Video interviews accompany the readings to give a firsthand look at these poetic personalities.



The Rebecca Project

Rutgers University Press / ★★★★★; \$69.95 list

Alfred Hitchcock turned Daphne Du Maurier's 1938 Gothic romance novel *Rebecca* into a riveting film; Hollywood turned it into a public phenomenon. The CD-ROM examines *Rebecca*'s life span, from novel to overmarketed star vehicle. Video-annotated analyses of the film include examinations of Hitchcock's directing techniques and feminist theories from several writers. Scan through movie clips from *Rebecca* and other Hitchcock films, as well as studio stills, press books, ad campaigns, book covers, and the reissue trailer.



Games

Marathon 2: Durandal

Bungie Software / ; \$39 list

Sure, Marathon 2 may be yet another violent, first-person shoot-'em-up, but it's the game that erased all doubt of the Mac's suitability for action games. Marathon 2's combination of great 3-D graphics, directional stereo, and a frenzied pace makes it a Mac gaming classic. It also lets as many as eight players compete over a network in game variations such as Tag; Kill the Guy with the Ball; King of the Hill; and of course, good ol'-fashioned Total Carnage.

WarCraft II

Blizzard Entertainment / ; \$54.95 list

The Orcs and the Humans are at it again, locked in battle over the land of Azeroth. But WarCraft II isn't just a continuation of the original WarCraft — there are dozens of new buildings, characters, and missions in this real-time strategy war game. There's also an editor you can use to create your own maps, and the game allows up to eight players to play over a network.



X-Wing Collector's CD

LucasArts / ; \$49.95 list

For flight-sim aficionados, X-Wing is a must-have. It offers over 130 missions, beautifully rendered animations, and enemies who draw on artificial intelligence for their relentless cleverness. It's also been enhanced to take advantage of the PowerPC chip, so the graphics, animations, and game play are even better than in the PC version.



You Don't Know Jack X-tra Large

Berkeley Systems / ; \$40 estimated street

The only multiplayer game for the Macintosh that successfully combines game play and humor, this game show with an attitude will have you rolling in the aisles with its wisecracking host and zany questions. Plus, it's the only game around that lets you literally screw your opponents. Need more questions? Check out the You Don't Know Jack Question Pack (\$20 estimated street).

Full Throttle

LucasArts / ; \$29.95 list

Take some leather; mix with burnt rubber and exhaust; add motorcycles, murder, and mayhem; and place them all in a *Blade Runner*-meets-*Mad Max* setting, and you have Full Throttle. In this graphic adventure, you play a gang leader framed for murder; your goal is to clear your name while saving America's last motorcycle factory. Full Throttle is proof that games with great animation and an interesting story line needn't take a back seat to those with full-motion video.

Five STAND-OUT STINKERS

MEDIOCRITY IS EASY to find among CD-ROMs, but only a few discs deserve to be approached with nostrils firmly pinched. Here are four new standard-setters and a Hall of Famer (now mercifully discontinued).

THE CONTRACT — Educorp

It's like watching C-SPAN through a Vaseline-coated rifle scope: A huge blue circle encases small, murky video bites of Newt Gingrich and his contemporaries spouting on about the Contract with America, the Oklahoma City bombing, and so on. Even Miss America doesn't look good from this angle.

THE GREAT KAT'S DIGITAL BEETHOVEN ON CYBERSPEED

— Bureau of Electronic Publishing

Speed-metal violinist The Great Kat plays with attitude to spare, but the few successes among her musical snippets can't compensate for the buggy interface; clumsy navigation; and the dominatrix-

costumed Kat's tiresome, boy-focused "be my slave" routine.

MACKENZIE AND COMPANY — Her Interactive

Operating under the principle that any product that entices girls to use a computer is good, Her Interactive fills five discs with a mind-numbing array of vapid activities based on shopping, make-up, and boy-attracting. This cloying collection has something to offend every thinking woman.

PHONE SEARCH USA 2.0 — DeLorme

DeLorme may have the market cornered with its extraordinary street atlas, but its digital directory is

inexcusable. In fact, we couldn't even get this ugly, awkward directory of outdated information to work with its atlas counterpart as advertised. Given its much better competition, this product is nothing more than an embarrassing offering for Mac users.

PING AND KOOKY'S CUCKOO ZOO — [EA*Kids]

When *MacUser* first reviewed this astonishingly irritating children's game, our reviewer described it as "an infuriating mishmash of unimaginative animations, grating music, and condescending voices that purports to teach preschool skills." Not much to add, really — except that its soundtrack alone is an excellent argument for strict handgun control.



Monty Python and the Quest for the Holy Grail

7th Level / ; \$45 list

This self-proclaimed "Best Strategy Game of 932 A.D." is a must-have for Monty Python fans. If you can stop laughing for just a moment, you'll find that the quest for the Holy Grail leads you through games of Spank the Virgin, Catch the Cow, and Drop Dead. This game is one of the few games around in which you'll want to click on anything and everything, because you'll never know what's going to happen.

Entertainment and Leisure

Monty Python's Complete Waste of Time

7th Level / ; \$50 estimated street

Unabashedly silly and true to its name, this disc will have you abandoning all dignified purpose within seconds. You'll be smashing people-headed gophers, spotting loonies, "pythonizing" your desktop and system sounds ("You naughty person!"), singing along to the Lumberjack Song, and chasing down video clips of classic Monty Python sketches such as "Nudge, Nudge" as you explore Mrs. Zambesi's brain (the main navigational device) and possibly even discover the secret to intergalactic success along the way.



Reflux — Issue 2: The Threshold

Inverse Ink / ; \$12 list

Reflux is a serialized cyberpunk comic book so alive that it crackles and hums on your screen. Some panels morph into videos when you click on them (showcasing Inverse's clever repurposing of kung-fu movie footage), whereas others offer hot spots that trigger animated episodes — and the click of a button switches you among three characters' perspectives. The plot may be convoluted, but following it is an E-ticket ride.

ASSUMING
I CAN MAKE
IT TO A PUBLIC
TERMINAL, I'LL
BE ONLINE
AT 5:00 AM.

HOPE
TO SEE YOU
ON THE
THRESHOLD



The Residents' Bad Day on the Midway

Inscape / ; \$50 estimated street

"Bad day" is an understatement for what happens when you get sucked into the nightmarish carnival in this title. As twisted and visually compelling as Freak Show, the previous collaboration between artist Jim Ludtke and performance-art band The Residents, this disc adds a novel plot device: You jump among the minds of a



dozen or so characters during random encounters as you tour the midway's repellent attractions. Your goal: to satisfy your curiosity before you meet with a nasty accident and *wish* you were only having a bad day.

Anne Hooper's Ultimate Sex Guide

DK Multimedia / ★★★★★; \$39.95 list

This disc provides an embarrassment-free way to find out how much you *really* know about humankind's most persistent recreational activity. Featuring interactive questionnaires (to point you toward recommended programs and "Sexopedia" topics); tasteful, strategically shot videos; animated diagrams; case studies; password-protection; and the crisp, no-nonsense persona of British sex therapist Anne Hooper, this guide can enrich almost anyone's knowledge of this perennially hot topic.

Rock Climbing

Media Mosaic / ★★★★★; \$49.95 list

Rock Climbing is a refreshing example of a how-to CD-ROM that works, offering more than a book can without losing a book's ease of navigation. Based on the book *Mountaineering: The Freedom of the Hills*, it's packed with clear, easy-to-follow animations and videos of rock-climbing techniques. Pop-up definitions are another plus, and the clever use of ambient sound and voice-overs makes you feel like you're right there at the base camp, rubbing your sore muscles and shooting the breeze with your climbing buddies.

Virtual Tarot 2.0

Virtual Media Works / ★★★★★; \$35 estimated street

Can a tarot-card reading done on a computer seem as believable as one done by a gypsyish stranger? Surprisingly, the answer in this case is yes. Virtual Tarot combines a player-influenced card-dealing mechanism with trance-inducing music, beautiful graphics (in both the playing environment and the reproductions of the classic Rider-Waite deck), and a wealth of information about card interpretations. Navigation can be slow, but the keyboard shortcuts help.



Kid's Stuff

Jump Start Second Grade

Knowledge Adventure / ★★★★★; \$36.95 list; ages 6 – 8

If you want to give your child a consistently excellent computer-learning experience from toddlerhood through elementary school, we heartily recommend the Jump Start series, from Knowledge Adventure. Although Jump Start 2nd Grade's endearing characters, challenging games, and surprisingly sophisticated music make it our favorite, any Jump Start title — Toddlers, Preschool, Pre-K, Kindergarten, Kindergarten Reading, 1st Grade, 3rd Grade, or 4th Grade — would be a welcome addition to your kid's collection.

Trudy's Time and Place House

Edmark / ★★★★★; \$29.99 list; ages 3 – 6

Nobody creates better early-learning software than Edmark — its love for kids and learning is readily apparent in each title in its House series: Millie's Math House; Bailey's Book House; Sammy's Science House; and our most recent favorite, Trudy's Time and Place House. Trudy, a friendly little alligator with a Band-Aid on her knee, hosts an exceptionally inventive series of games that teach the abstract concepts of time and place.

Africa Trail

MECC / ★★★★★; \$49.95 list; ages 10 – 16

The latest in MECC's highly regarded "Trail" series — Oregon Trail, Amazon Trail — may very well be the best yet. Based on events and images from an actual bicycle expedition, Africa Trail invites you to plan and participate in your own virtual journey down the length of the African continent, meeting people, solving problems, listening to music — even playing a well-designed bike-riding arcade game.



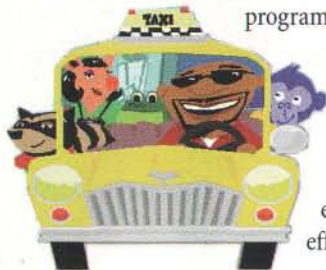


TOP 50 CD-ROMs

Infinity City

Headbone Interactive / ; \$29.95 list; ages 4 – 8

Singing taxi driver Zack and his animal pals in the GiggieBone Gang explore early math — such as counting, geometric shapes, money transactions, and size relationships — in this lively, entertaining program. Fifty activity modules ensure variety in topic areas and in the ways information is presented: Picture puzzles, stories, and interactive Poke'n'Prod games are engaging and educationally effective.

**World Discovery Deluxe**

Great Wave Software / ; \$49.95 list; ages 8 and up

If a geography bee strikes you as a form of cruelty, check out World Discovery Deluxe, an exhaustive, challenging, and highly *fun* series of geography-based games. Trivia quizzes, tricky map puzzles, and even audio clips of nations' national anthems are used to test and teach knowledge of the world and its peoples. This program proves that drill-and-practice instruction doesn't have to be dull and static.

Freddi Fish 2: The Case of the Haunted Schoolhouse

Humongous Entertainment / ; \$39.95 list; ages 3 – 8

Great animation, good (and judiciously brief) musical numbers, and an involved-and-involving mystery plot make this a fitting sequel to the also excellent Freddi Fish and the Missing Kelp Seeds. Freddi and her



cartoony friends are mainly entertainment — they don't pretend to teach undersea facts — but the puzzles they encounter require plenty of logical, sequential thinking — and deliver hours of entertaining game play.

Logical Journey of the Zoombinis

Brøderbund / ; \$39.95 list; ages 8 – 12

If you're tired of buying kid's games that get only one or two play attempts before they're shelved for good, Brøderbund's Logical Journey of the Zoombinis is for you. There are many hours of play time — and multiple levels of difficulty — as you learn and exercise math-related reasoning skills to help a bevy of exceptionally cute Zoombinis find their way to a new home.

Mighty Math Number Heroes

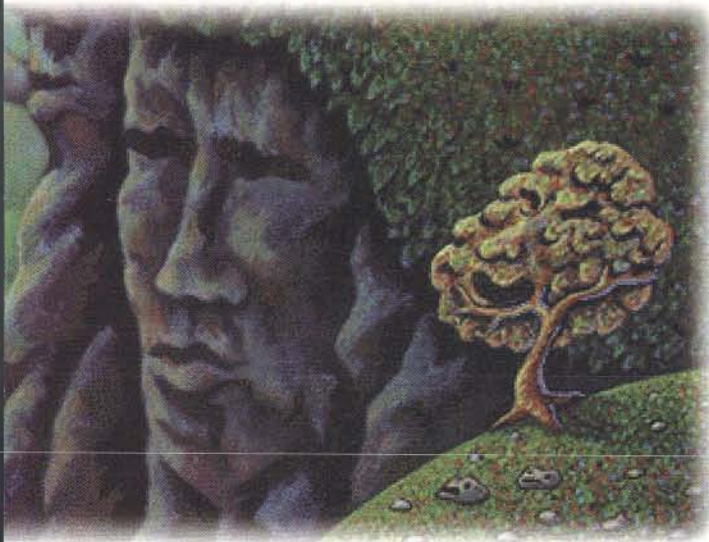
Edmark / ; \$39.99 list; ages 8 – 10

There's no way around it: Learning math takes practice — lots of practice. Luckily, the software geniuses at Edmark have come up with a way to make that practice not only fun but also consistently challenging (even, we hesitate to admit, for some grown-up editors here at *MacUser*) as statistics, fractions, geometry, and good ol' arithmetic are taught in engaging and visually stimulating games.

Morton Subotnick's Making Music

Voyager / ; \$39.95 list; ages 3 and up

The goal of this ingenious, open-ended introduction to music is to let kids learn about melody, harmony, and song structure by playing around. Activities include an area where pieces of well-known kids' songs can be rearranged or mixed and matched; a tune builder,



where you change notes and rhythms by moving birds on a telephone-wire staff; and a simple piano-roll note sequencer that works much like grown-up MIDI programs.

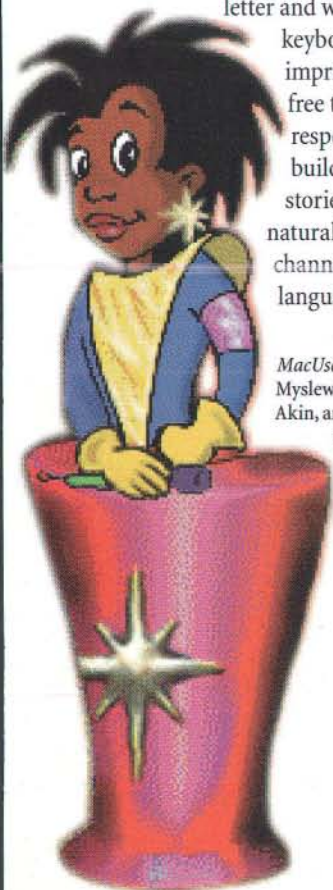
Read, Write and Type

The Learning Company / \$50 estimated street; ages 6 – 8

Designed for prereaders, this program offers a unique and useful combination of keyboarding instruction, letter and word recognition, and phonics. Each

keyboard key represents a storyteller who's imprisoned by a nasty computer virus. You free the storytellers by mastering their respective keys and then use their letters to build increasingly complex words and stories. The program harnesses young kids' natural button-pushing curiosity and channels it to build both typing and language skills.

MacUser editors Carolyn Bickford, Jim Bradbury, Rik Myslewski, Karen Ohlson, Nancy Peterson, Jim Shatz-Akin, and Brooke Wheeler put plenty of wear and tear on their CD-ROM drives in contributing to this story; Assistant Editor LaMont Ridgell deserves special thanks for his tireless efforts.



BOOKMARK

RELATED INTERNET SITES

Most of the companies listed in this directory also have Web sites where you can find more information about their products. The URL below provides a jumping-off point to all these sites.

GO TO http://www.zdnet.com/macuser/mu_1296/cdrom.html



Directory

A.D.A.M. Software
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Brøderbund
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415-382-4400

Bungie Software
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Great Wave Software
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Headbone Interactive
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Houghton Mifflin Interactive
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7th Level
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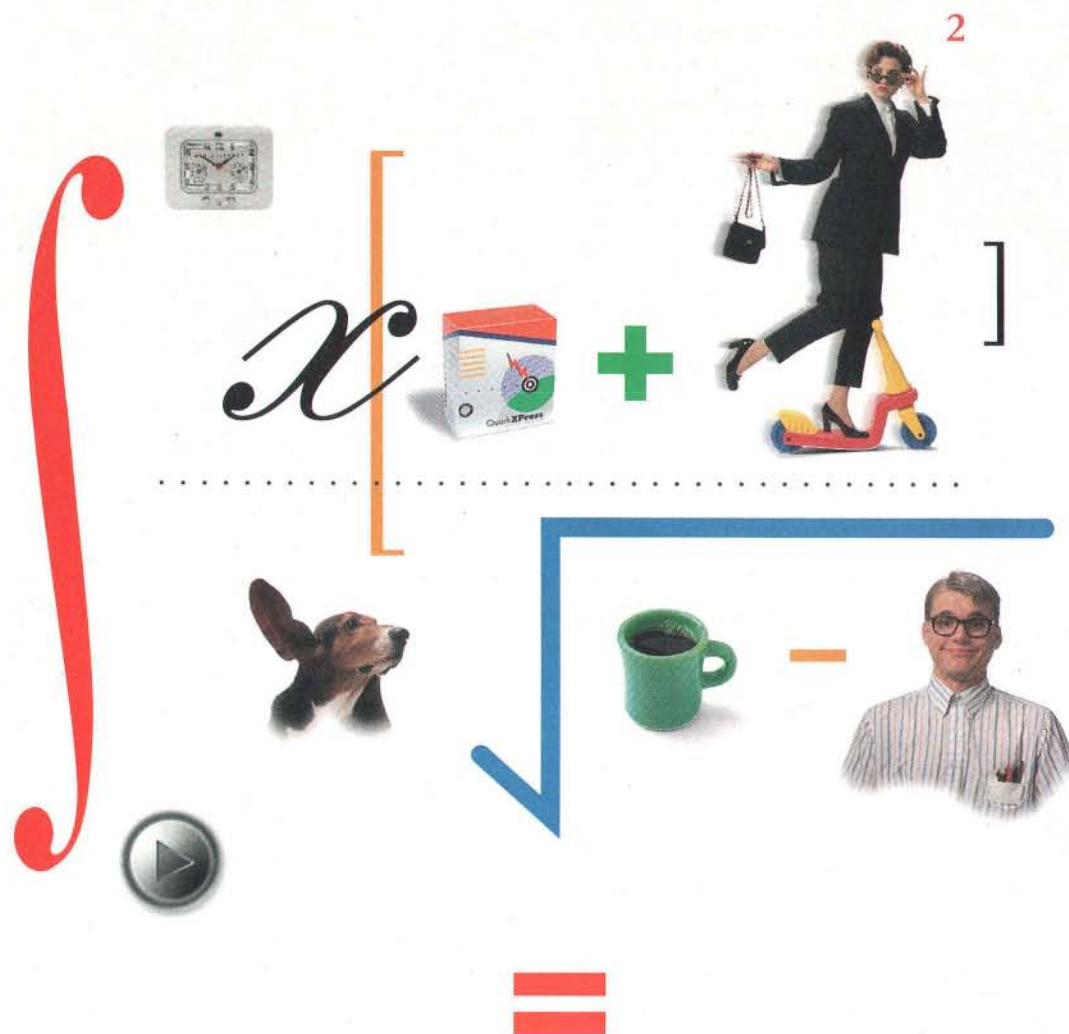
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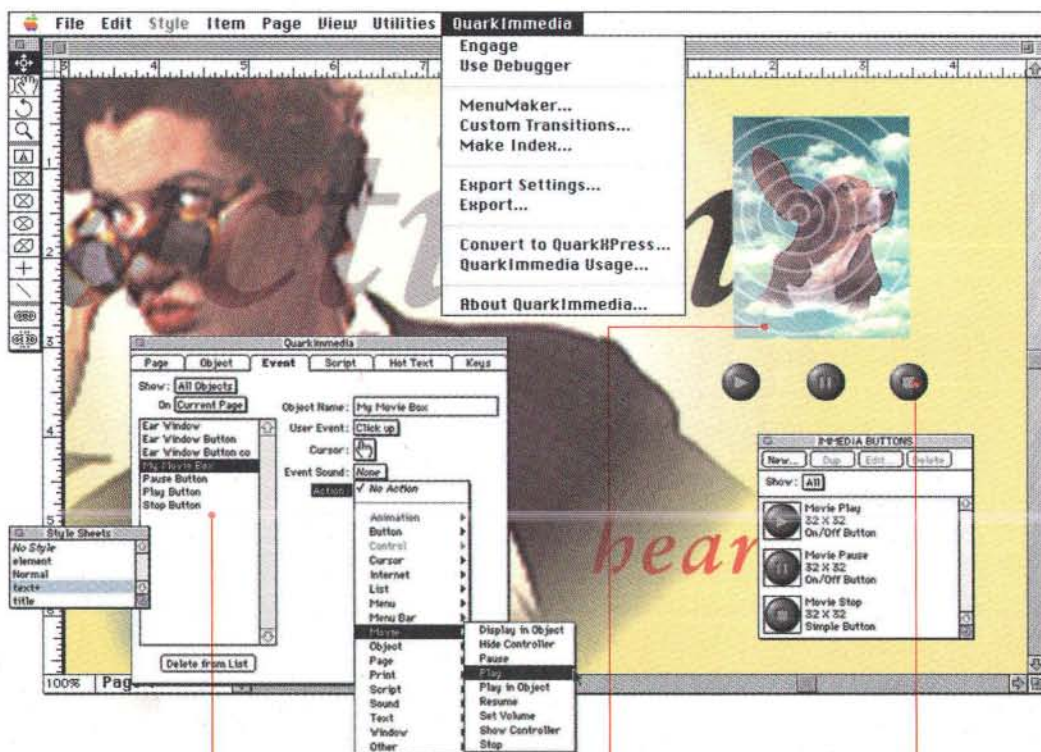
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QUARK

The Burden *of* PROOF

ACCURATE COLOR PROOFS ARE VITAL TO DESKTOP PUBLISHERS.
MACUSER LABS TESTS EIGHT DYE-SUBLIMATION PRINTERS AND
PICKS THE BEST OF THE BUNCH.



DESKTOP-PUBLISHING PROS take their color seriously. Color must be accurate from start to finish, from photo to final press output. A surefire way to ensure that your four-color layouts are accurate is to proof them before they go to press — you'll save guesswork, time, and money. But in order to proof successfully, you need a way to make sure your prints match what you see on your monitor and you need a printer that can simulate a variety of printing-press technologies. Speed is also an important consideration.

With their ability to produce continuous-tone, photographic-quality images, dye-sub printers are the printers of choice for serious desktop publishers. They offer a more convenient, affordable proofing method than do Matchprint proofs created on-press. To find out which of the

eight latest dye-sub printers — ranging in price from about \$6,000 to \$20,000 — makes the best color proofing system, MacUser Labs put each printer through its paces. We looked at print quality, speed, and the color-management tools that ship with each. With one exception, all the printers support full-bleed, tabloid-sized media — an important feature for proofing two-page color spreads.

In general, each printer we tested produced good-looking results, but there were some wide discrepancies in color accuracy. And when our experts looked closely at image details, other strengths and weaknesses appeared. In the end, one printer stood out from all the rest: The Tektronix Phaser 480X not only boasts the best looking prints but it also provides flexible, easy-to-use color-correction features.

BY ROMAN LOYOLA



DYE SUBLIME

Dye-sub printers are like laser and inkjet models in that they use dots to create images on paper. But what makes dye-sub printers different and able to produce photographic-quality images is the way in which they apply the dots. Rather than applying them in clusters, as color laser and inkjet printers do, dye-sub printers use a grid that allows colors to blend together. Here's an example: To make red, laser and inkjet printers place a yellow dot and a black dot very close to a magenta one. The result fools the eye into seeing red, but there's no mistaking the distinctive dot pattern that characterizes output from these printers. Dye-sub printers, on the other hand, are able to produce a true red by blending dyes. Another advantage is that dye-sub printers can vary the density of each color by applying different degrees of heat to the dyes.

A dye-sub ribbon has one panel each of cyan, magenta, yellow, and black dye. The printer's heating element changes the dye on the ribbon from a solid to a gas, which is diffused onto chemically coated paper. As the dye diffuses, it blends with other dots, helping to create the distinctive continuous-tone output that is the hallmark of dye-sub printers.

Conventional printer wisdom holds that the higher the resolution, the better the image quality, but this doesn't hold true for dye-sub printers reproducing photographic images. Although the eight printers we tested support 300-dpi resolution, rather than the 600-dpi-and-higher resolution of laser and inkjet printers, the lower resolution doesn't affect the

quality of photographic images, because there are no dot patterns to contend with.

The cost per page with dye-sub printers is considerably higher than that with laser and inkjet printers, however. Factoring in ribbons and media, the cost per page is about \$7. But then again, when you consider the cost of using a Matchprint proof for proofing — about \$150 — you still come out way ahead over time.

PHOTO FINISH

Of all the criteria we used to evaluate the printers, we gave the most weight to image quality. If a dye-sub printer can't produce high-quality, color-accurate images, its value as a proofing device is severely compromised. To rate the printers for image quality, we used a variety of test images. We printed an Adobe Photoshop file containing a tabloid-sized photo from the Graphic Arts Technical Foundation (Pittsburgh, PA; 412-621-6941) that had a wide range of colors as well as skin and other natural tones, varying degrees of highlight and shadow, fine detail, and a gray gradient background. In addition, we printed a two-page spread, created with QuarkXPress, containing TIFF and EPS images as well as text. Last, we printed a technical illustration created with Adobe Illustrator.

Because the Kodak Digital Science 8650 PS doesn't support tabloid-sized media, we resized the image to fit on letter-sized media and printed the two-page layout as two separate pages to test it. All of our test files were printed at commercial-press quality, and the results were judged by a jury of publishing experts, who compared the printers' output to Matchprint proofs created from the same test files.

The clear winner for image quality was the Tektronix Phaser 480X. Its color accuracy was quite good, highlights and shadow detail were excellent, and metallic objects didn't produce "flares" in the image. The gray background in the GATF image reproduced evenly and accurately. We did notice a very slight magenta cast, which gave natural tones a somewhat reddish appearance (we were able to use the printer's color-correction tools to easily adjust for the cast), and the colors weren't quite as saturated as those from some of the other printers.

A close second for image quality was the NewGen ChromaxPro. Its color accuracy was very good, and like the Tektronix printer, it maintained a high level of sharpness and detail in our GATF image.

The most disappointing output was that from the Imation Rainbow Model 2730, one of the most expensive printers we tested. The images appeared washed out, and a brownish hue covered everything. Registration was poor too — in some areas, we could distinguish the separate color plates.

Our jury also found fault with output from the Seiko ColorPoint 835 PS. With the GATF file, the Seiko printer had trouble with highlights, creating "hot spot" effects, and the colors were inaccurate. One bonus the Seiko — and the Fargo — printer offers over the others in our roundup is that it can double as a thermal-wax printer. This ability means that you can use thermal-wax mode to produce rough proofs that cost

THE BOTTOM LINE

WITH THEIR ABILITY TO PRINT CONTINUOUS-TONE, photographic-quality images, dye-sublimation printers make ideal color proofing systems. Although image quality is by far the most important qualification, a color proofer should come with a capable, well-designed set of color-management tools as well. In rating the eight printers in this roundup, we also considered price and speed.

+ / OUTSTANDING		● / ACCEPTABLE		- / POOR	
RATING	PRODUCT	PRICE	IMAGE QUALITY	COLOR MANAGEMENT	SPEED
★★★★★	Tektronix Phaser 480X	●	+	+	●
 Boasting an unbeatable combination of good image quality and solid color-management tools, the Phaser 480X is our top choice for color proofing. Its superb color accuracy and easy-to-use software make it a standout in its field.					
★★★★	NewGen ChromaxPro	●	+	+	-
★★★★	Imation Rainbow Model 2715	●	●	+	-
★★★★	Kodak DCP 9000	●	●	●	●
★★★★	Fargo Pictura 310e	+	●	●	-
★★★★	Imation Rainbow Model 2730	●	-	+	+
★★★★	Kodak Digital Science 8650 PS	●	●	●	●
★★★★	Seiko ColorPoint 835 PS	●	-	●	●

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a lot less per page than dye-sub output and that you can use to print business graphics.

Images printed by the Kodak DCP 9000 offered clear evidence that the quality of the color-correction tools that ship with a printer can make a big difference to image quality. Even though the DCP 9000 uses the same print engine as the Seiko printer, its output looked much better — its color accuracy was good, and image details reproduced well. When we compared the Kodak printer's output with the Matchprint proofs, however, it was quite dark.

The \$10,000 Imation Rainbow Model 2715 and the \$5,995 Fargo Pictura 310e use the same Fargo 310 print engine. But they differ not only in price but also in output quality. We preferred images printed by the Rainbow Model 2715 — the colors were quite accurate and better than the Fargo printer's. Both printers produced better results than the Model 2715's more expensive sibling, the Model 2730, however.

Although dye-sub printers excel at printing photographic images, their weakness lies in printing font sizes typically used for body text. The Kodak DCP 9000 had the best text output of the eight printers, maintaining serifs with few jagged edges. The other printers produced text that was either too heavy or jagged or broken. In addition, none were able to produce a good-looking black for text — in every case, characters were more a deep dark brown than black.

COLOR MANAGEMENT

Publishing pros know that color management is a vital aspect of color proofing. Not only should the output from your proofing device match the colors on your monitor but it should also match the final output you get from the press. Each of the printers we tested comes with a set of tools for adjusting color. We used these tools not only to see how accurate they were but also to find out how easy they were to use. We found that all the bundled software tools are more or less adequate, but three bundles stand out from the rest.

We were most impressed by the tools that come with the Tektronix Phaser 480X. Nine color-matching profiles are

available through the printer driver, plus you can get additional color profiles from Tektronix's BBS. The calibration utility, PhaserMatch, offers an easy and simple approach for editing profiles and calibrating the printer. You can also adjust for the target paper color as well as tinker with individual CMYK values and dot gain.

The 3M Rainbow Color Proofing System, available with both Imation printers, isn't as straightforward to use as Tektronix's offering, but it provides options that experienced users will appreciate. With the 3M software, you can perform RGB proofing, print eight-color separations, save files that have been RIPed (raster-image-processed), and adjust for particular press-media tints.

Instead of being software-based, the NewGen ChromaxPro's color-management system is built into the printer. NewGen uses its proprietary ChroMATCH system, which is embedded in the PostScript Level 2 RIP. Color-matching chores are reduced to a single simple task: You choose either the 3M Matchprint or the Fuji ColorArt option, depending on your final output media. When the ChromaxPro prints, it makes adjustments according to your selection. For those who need more options, NewGen provides a Full Gamut option — available via the printer's front control panel — for use with other third-party systems. NewGen plans to provide additional proofing-system profiles in the future.

The Seiko printer provides color-management tools conveniently through its printer driver and via the MatchPoint Tools calibration utility. Through the driver, you can adjust for RGB and CMYK conversions as well as select a smoothing method and resolution. MatchPoint Tools consists of three applications you can use to compensate for calibration, color adjustment, and dot gain for final press output.

The Kodak Digital Science 8650 PS uses UltraColor, Kodak's



BOOKMARK

RELATED INTERNET SITES

- Apple's ColorSync 2.0 Overview Page
An in-depth discussion of color and the benefits of color management for printing.
- GO TO http://www.zdnet.com/macuser/mu_1296/features/dyesub.html

SPEED-TESTING DYE-SUB PRINTERS



We created three tests to gauge the speed of each dye-sub printer. For our Adobe Photoshop test, we used a file from the Graphic Arts Technical Foundation. Our QuarkXPress file consisted of a two-page, full-bleed color spread that incorporated a TIFF and an EPS image as well as some text, and our Adobe Illustrator document helped us evaluate RIP performance with a real-world EPS file.

Our test platform was an Apple Power Mac 9500/132 with a 1.2-GB hard drive and 128 MB of RAM. We replaced the Power Mac's standard ATI graphics card with a Radius Thunder/30 graphics card that was set for 24-bit color. Each system was connected to a Radius PressView 17 SR monitor

calibrated to D50, using a Radius ProSense calibrator. With the exception of the two Imation printers, which need a host Mac for print processing, we used

Ethernet. We printed all files on tabloid-sized paper, except in our tests of the Kodak Digital Science 8650 PS, which prints only on letter-sized media.

	ADOBE PHOTOSHOP	QUARKXPRESS	ADOBE ILLUSTRATOR
✓ MacUser BEST BUY			
■ BEST PERFORMER IN EACH TEST			
Imation Rainbow Model 2730	7:03	9:49	5:40
Kodak DCP 9000	10:38	12:26	5:40
✓ Tektronix Phaser 480X	9:24	15:05	4:42
Kodak Digital Science 8650 PS	11:16	16:33	3:06
Seiko ColorPoint 835 PS	13:28	12:51	6:39
Imation Rainbow Model 2715	15:11	15:09	15:39
NewGen ChromaxPro	31:20	18:12	11:31
Fargo Pictura 310e	14:22	43:23	10:28
	MINUTES	MINUTES	MINUTES
	SLOWER	SLOWER	SLOWER

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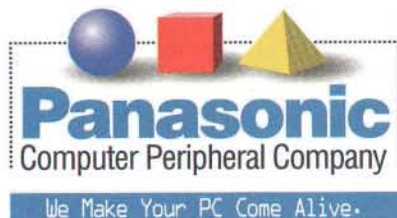
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AppleVision 1710	0.25	1280x1024	30-82	16.1"	1	\$1,077
Radius PrecisionView 17	0.25	1024x768	31-64	16.0"	1	\$789
Sony 17seII	0.25	1600x1200	30-85	16.0"	3 P&L, 2 CRT	\$963

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MN13-MACU

THE CLOSER YOU LOOK / aspiring color laser printers

DYE-SUBLIMATION PRINTERS MAY BE GETTING a run for their money from the latest crop of 600-dpi color laser printers. The \$12,500 Canon C LBP 360PS, the \$10,699 Digital Colorwriter LSR 2000, and the \$8,999 IBM Network Color Printer each combine an EFI Fiery XJE controller and a Canon engine to offer a kind of continuous-tone printing. Continuous-tone printing is what enables dye-sub printers to produce photographic-quality images — an essential feature for desktop publishers doing color proofing.

Dye-sub-printer makers define continuous-tone printing as the ability to vary the density of each pixel to produce 1 of 256 shades of color and to blend colors, rather than using strategically placed dots to fool the eye into seeing a particular color. As a result, they deliver true color without having to resort to halftoning, as inkjet, thermal-wax, and color laser printers have traditionally done.

Canon, Digital, and IBM, however, are defining continuous-tone printing a little differently as they promote their new printers. Although color laser printers are incapable of varying the density of each pixel, the data received by the new printers from the Fiery controller is, in fact, continuous-tone multibit data (8 bits per cyan, magenta, yellow,

and black), the same information that dye-sub printers receive. The controller processes the multibit data and sends it to the engine, which is able to interpret it and apply the colors. Even though other output technologies could,

theoretically, use the controller to process multibit data, the print engine would have to have the ability to digest all the information and transfer the images to paper — not a trivial task.

But although the definition of *continuous-tone* may differ somewhat between makers of dye-sub and color laser printers, the proof is in the output. From a normal reading distance, one foot, output from the Canon, Digital, and IBM printers looks to be photographic-quality. Gradients are smooth and subtle, and colors are vibrant and realistic. But a closer look reveals the telltale signs of halftones — namely, dots and specialized screening.

The bottom line? Image quality from color laser printers has jumped by leaps and bounds in the past few years. But even though images from the latest trio of color lasers may look nearly identical to those printed by dye-sub printers when

viewed from a distance, discerning desktop publishers are not likely to be fooled — yet. / TONY BOJORQUEZ



The \$12,500 Canon C LBP 360PS color laser printer combines the EFI Fiery XJE controller with a Canon engine.

proprietary rendering method for simulating the colors on your monitor. The Kodak DCP 9000 also uses UltraColor, but it lets you select from a variety of profiles. You can download additional profiles if the one you need isn't installed, and you can use the calibration utility that accompanies the DCP 9000 to adjust the printer for the media your press uses.

DYE-SUB DERBY

To gauge printing speed, we connected each printer (with the exception of the two Imation printers, which don't have Ethernet connections) via Ethernet to an Apple Power Macintosh 9500/132 with 128 MB of RAM. If the printer used its own onboard processor and RAM, we equipped it with

FEATURES OF DYE-SUB PRINTERS

✓ MacUser BEST BUY	FARGO PICTURA 310E	IMATION RAINBOW MODEL 2715	IMATION RAINBOW MODEL 2730	KODAK DCP 9000
List price (as tested)	\$5,995	\$10,000	\$18,500	\$17,995
RAM (standard, max., as tested)	NA	NA	NA	48 MB, 112 MB, 48 MB
Standard ports	serial, parallel	serial, parallel	SCSI, parallel	Ethernet*, parallel, SCSI†
Ethernet	none	none	none	standard
Hard-drive capacity	none	none	none	optional external
PostScript type and level	Adobe Level 2 CPSI [§]	Adobe Level 2 CPSI [§]	Adobe Level 2 CPSI [§]	Adobe Level 2
Number of ROM-resident fonts	none	none	none	39
Maximum image area	11.95 x 17.4 in.	11.95 x 17.4 in.	12.2 x 18.1 in.	12.16 x 18.0 in.
Warranty	1 year	180 days	90 days	6 months
Company	Fargo Electronics Eden Prairie, MN 800-327-4622 612-941-9470 http://www.fargo.com/	Imation Oakdale, MN 800-257-8488 612-737-9545 http://www.imation.com/	Imation Oakdale, MN 800-257-8488 612-737-9545 http://www.imation.com/	Eastman Kodak Rochester, NY 800-235-6325 716-726-7260 http://www.kodak.com/

*Has both 10BASE-2 and 10BASE-T ports. †One for connecting to host, one for an external hard drive. §Ethernet is standard on the model we tested. ¶Software RIP.

enough RAM to process a four-color print job. One word to the wise: If your print jobs are four-color, not three-color, be sure the printer you buy has enough RAM. The standard RAM configuration for some printers is sufficient only for three-color printing. And if you need to do trapping and other proofing tasks, you'll need even more. We also used Radius Thunder/30 graphics cards, set to 24-bit color; Radius Press-View 17 SR monitors, calibrated to a color temperature of D50 (the standard for desktop publishing); and Radius ProSense calibrators, for calibrating each system.

The overall fastest printer we tested was the Imation Rainbow Model 2730. It connects to your Mac as a SCSI device — a drawback if your SCSI chain is full. Fortunately, it has two SCSI ports, so you can put it anywhere in your SCSI chain. Unfortunately, it doesn't come with a SCSI cable. One other thing to consider: The Rainbow Model 2730 doesn't have an onboard processor or RAM; it requires the host Mac to perform all processing.

Our image-quality champ, the Tektronix Phaser 480X, was third overall in speed, behind the Kodak DCP 9000. The Imation Rainbow Model 2715 produced good-looking output for its price, but we had to wait a long time to see it. Like the Model 2730, the Model 2715 uses a dedicated Mac for processing, but it has a serial interface — it took more than 15 minutes to print each of our test files. The Fargo Pictura 310e was another slow performer, taking more than 40 minutes to print our QuarkXPress document.


The speed of the NewGen ChromaxPro using the standard 48 MB of RAM was disappointing. NewGen claims that installing more RAM allows the printer to process larger image segments, resulting in faster printing speeds. However, before you run out and buy a ChromaxPro, you should determine the maximum amount of RAM you'll need. Adding

RAM later can be inconvenient, because you can't just snap new SIMMs onto the motherboard as you can with most other printers. In addition, you must swap out the hard drive, since its controller is configured for the printer's currently installed RAM. In order to upgrade the printer, you have to cart it to an authorized NewGen dealer, who will in turn send it away to have the new RAM and hard drive installed. This process takes about two days.

FINAL PRINT

Our favorite among the eight dye-sub printers we tested was the Tektronix Phaser 480X — its top-notch image quality and easy-to-use software tools were an unbeatable combination. But before you run out and buy one, be sure to work out how much RAM you'll need — plan on at least 48 MB for four-color printing and even more if you want to do trapping and overprinting.

We were also impressed with the NewGen ChromaxPro's image quality. An added plus is the printer's ChroMATCH technology, which reduces color management to one simple step. However, the printer's design can make upgrading more of a hassle than it should be.

For those on a budget, the Imation Rainbow Model 2715 is an attractive alternative. For several thousand dollars less than the Tektronix and NewGen printers, it offers acceptable color accuracy. The one caveat is that it doesn't have an onboard processor — a host Mac is needed to do the grunt work of processing print jobs. 

Before coming to *MacUser*, Associate Editor Roman Loyola learned the tricks of the printing trade with the Alameda Newspaper Group. MacUser Labs Associate Project Leader Martin Wong managed the testing for this report, assisted by Project Leader Rick Oldano. Printer consultant Tony Bojorquez also contributed to this report.

KODAK DIGITAL SCIENCE 8650 PS	NEWGEN CHROMAXPRO	SEIKO COLORPOINT 835 PS	✓ TEKTRONIX PHASER 480X
\$10,795	\$15,995	\$19,100	\$19,995
32 MB, 64 MB, 48 MB	48 MB, 192 MB, 48 MB	28 MB, 136 MB, 92 MB	32 MB, 112 MB, 96 MB
LocalTalk, parallel, SCSI	LocalTalk, parallel, serial	LocalTalk, serial, parallel, Ethernet, SCSI	LocalTalk, parallel, serial
optional	optional (\$499)	standard	optional (\$595) ⁵
optional external	170 MB	256 MB	optional external
Adobe Level 2	Phoenix Level 2	Adobe Level 2	Adobe Level 2
35	35	39	39
8.0 x 12.0 in.	11.81 x 17.52 in.	12.48 x 19.88 in.	11.9 x 17.2 in.
1 year	1 year	1 year	1 year
Eastman Kodak Rochester, NY 800-235-6325 716-726-7260 http://www.kodak.com/	NewGen Systems Costa Mesa, CA 800-756-0556 714-641-8600 http://www.newgen.com/	Seiko Instruments San Jose, CA 800-888-0817 408-922-5900 http://cgg.seiko.com/	Tektronix Wilsonville, OR 800-835-6100 503-682-7377 http://www.tek.com/

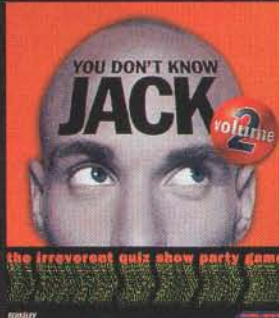


Virtual Pool from MacPlay has all the angles and shots of the real game—and then some. Features 4 great pool games, full-motion-video library, realistic physics and geometry, easy multiplayer modes, realistic 3-D perspective and graphics plus a musical jukebox.

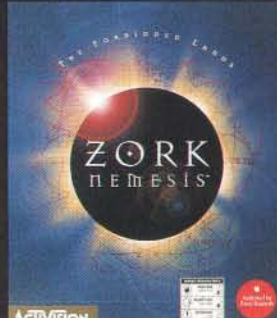


Five hundred years ago, Europe's conquering heroes pursued dreams of a new world. MacPlay's Conquest of the New World is a strategy game where you command explorers, settlers and mercenary soldiers as they discover a new world and build the ultimate nation.

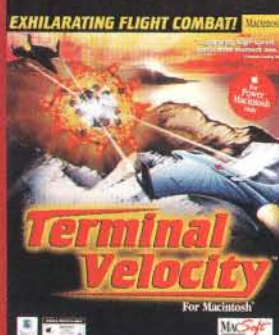
You Don't Know Jack, Volume 2, is the hilarious sequel to the original award-winning game. This Jack comes complete with 800 all-new questions, new question types, celebrity guest appearances, new features and more. From Berkeley Systems.



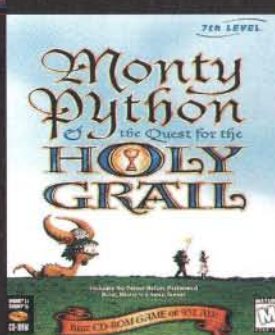
In Zork Nemesis, you're beckoned to the Forbidden Lands, a cursed world occupied only by the tortured spirits trapped there. Travel through 5 mind-bending worlds to discover the ancient secret of alchemy that will free the trapped souls from evil's grip. From Activision.



Is that the



MacSoft's Terminal Velocity offers fast 3-D texture-mapped graphics, full 360-degree flight movement and 7 weapons of extraordinary destruction as you fight your way through 9 unique planets with an awesome array of air-to-air and air-to-ground combat action.



The best CD-ROM game of 932 A.D.—Monty Python and the Quest for the Holy Grail from 7th Level, Inc. It will take you on a romp through King Arthur's England, uncovering clues, solving puzzles and playing wholesome games like "Burn the Witch" and "Spank the Virgin."

Westwood Studios' Command and Conquer takes you into a gritty, high-tech world where the art of electronic intelligence and covert surveillance reigns supreme. Where guerrilla strategies and savage combat are the norm. Muster forces and lacerate your enemies to the bone.



Tank Commander by Eidos Interactive slams you into the cockpit of an M1 Abrams tank as you test your split-second-decision skills against enemy tanks in over 25 fully textured missions. Destroy T-72, Leopard and Challenger tanks with over 7 weapons.



With its incredibly realistic flight models, 3-D photo-realistic landscapes and the use of real-world physics, Flight Unlimited re-creates the most accurate sensation of aerobatic flying ever experienced on the Macintosh. For best results, play before lunch.



Origin Systems' Wing Commander IV is one of the latest space-combat games for the Mac. Take on the role of Colonel Blair, played by Mark Hamill in breathtaking space battles and heart-pounding drama, as you fight your way through the most spectacular Wing Commander yet.



Get ready for the biggest adrenaline rush of the holiday season. We're talking new games for the Mac. We're also talking sweaty palms. Heart-pounding exhilaration. Stomach-in-the-throat thrills—the works. And here's the best part: with thousands of titles to choose from, you may never come down from that gaming high. Piqued your interest? Good.

smell of chestnuts burning? Or just your neurological

receptors going into overdrive?



So now you're probably wondering how to get your twitching fingers on these games. Just visit stores like CompUSA, Staples, Micro Center and Fry's Electronics. Or, flip through any Mac mail-order catalogs. Or, hop on the Net. But no matter where you go to find them, remember to look for the smiling Mac OS logo. (All great software wears this face.™) If you're ready to take your adrenal glands on the ultimate ride, visit www.macsoftware.apple.com. And learn more about games for your Macintosh® and how to find them. Of course, if you want to, you can always use a phone: **call 800-500-4862.**

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17-Inch Monitors: The



WITH PRICES DROPPING due to stiff competition in a marketplace serving Mac as well as PC users, 17-inch monitors have become smart upgrades and wise choices as entry-level products. If you're looking for your first Macintosh monitor, you're better off paying \$300 or so over the price of a 14-inch model to get a 17-inch monitor you won't rapidly outgrow. And compared to a 20- or 21-inch model, a 17-inch display system offers as many resolution choices — some support up to 1,600 x 1,200 pixels — in a smaller, sharper, and much less costly package. In fact, many professionals who require plentiful screen real estate are choosing to add a second, 17-inch monitor rather than switch to a larger model (see the "Seeing Double" sidebar).

Although a crowded marketplace makes for lower prices, it also makes buying decisions more difficult. That's where we can be of assistance. MacUser Labs enlisted the help of Ziff-Davis Labs' monitor-testing facility in benchmarking forty-seven 17-inch monitors, to find which provided the brightest, sharpest, most colorful, and least distorted images. Armed with the comprehensive test results and feature information for these monitors, our Best Buy recommendations, and our general advice for smart shopping in the monitor marketplace, you'll be well prepared to make a wise choice.

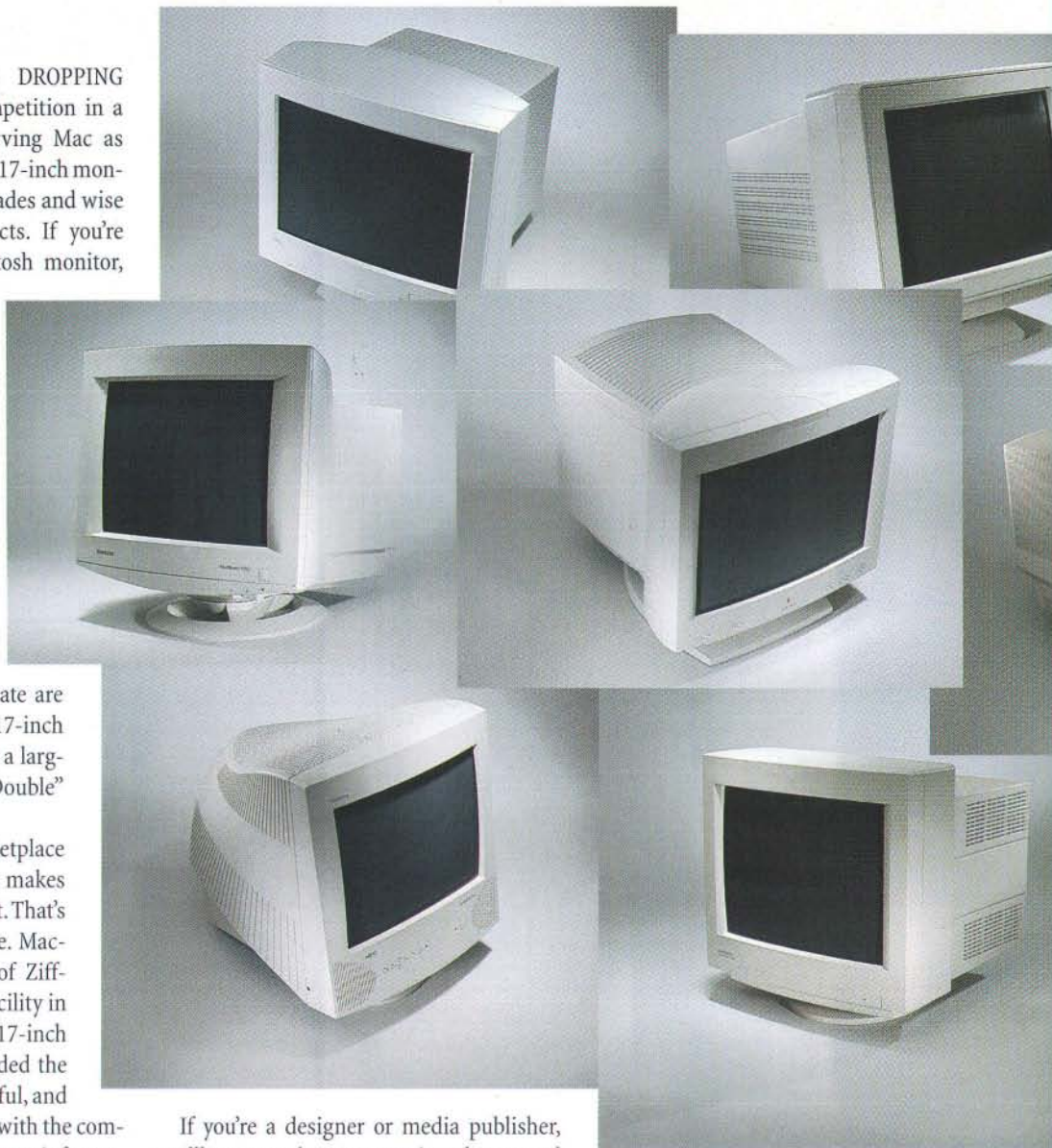
Focusing on Test Results

In looking at the results of our image-quality tests, you should consider not just which monitor is best, in general, but also which is best for *you*. Here are some tips on individual tests you may want to pay particular attention to, based on how you'll be using the monitor.

If you're a designer or media publisher, you'll want to choose a monitor that scored well in our Color Tracking test — higher scores indicate greater color accuracy. The Daewoo CMC-1703B, Mitsubishi Diamond Scan 17HX, Sampo AlphaScan 760, and WYSE WYSEvision WY-17PS tied for top honors, with scores of 98 percent — near perfection. Although the MAG InnoVision DX700T, which scored 87 percent, is OK for business use, we recommend that all buyers stay away from the MAG InnoVision DJ702, with its dismally low score of 60 percent.

If you do quite a bit of word-processing or spreadsheet work, pay close attention to the

results of our MTF Sharpness test. Scores above 50 percent are acceptable, but higher scores are better. Although the NEC Multi-Sync M700 scored the highest in this test, with a commendable 85 percent, it did not fare as well in our Misconvergence test, also a determining factor in perceived sharpness — nearly a third of the monitors we tested fared better. For scoring high marks on both the MTF Sharpness and the Misconvergence tests, top honors go to the CTX VL700, Sony Multiscan 17sflI, Samsung SyncMaster 17GLi, and NSA/Hitachi SuperScan Elite 17.



Bigger Picture

We recommend any of these for word-processing and spreadsheet work for which color accuracy is not critical.

Also, if you work in a room that has particularly high ambient brightness or if your system is next to a window, choose a monitor that scored well in our Brightness test. All the monitors we tested for this report had acceptable scores, but those whose scores came in above 25 footlamberts are ideal

for well-lit offices. Even though you may not need all the brightness a particular monitor can provide, it's a good idea to note which systems have the potential to give you extra brightness, because a variety of environmental conditions might

change. The headlight-bright Apple Apple-Vision 1710 Display scored 49 footlamberts, making it an ideal choice for even the brightest work environments.

Checking Specs

When you have 50 or so monitors to choose from, you can afford to be picky about more than just image quality and price. Check out the following specifications for any monitor you're considering: company warranty and repair policies, active screen size, maximum resolution, scan rates, dot pitch, tube type,

type of controls, Mac-readiness, and type of glare protection.

Warranty and Repair Policies. Pay particular attention to a monitor's warranty. Very long CRT warranties are great, because even though CRTs tend to be long-lived, they're expensive to replace when they break. Failure of other components is much more likely, so the length of the parts-and-labor warranty is even more important. We recommend that you purchase a monitor that has a long, full parts-and-labor warranty. Also, we recommend buying a monitor from a vendor that has a swap or cross-ship policy, which allows you to take a monitor in exchange for yours so that you can get back to work quickly.

Especially noteworthy is Compaq's on-site service for the first year of ownership (yes, this means that technicians actually make house calls). Finally, since it's quite possible that you can spend time waiting on hold when you call with questions, look to purchase products from vendors that offer toll-free phone support.

Active Screen Size. The viewable image area — measured diagonally from corner to corner — is a consideration if you want to make sure you're getting the maximum possible screen real estate, since not all "17-inch" monitors are alike. In fact, a monitor's viewable image area (determined by the size of the phosphor-coating area inside the rather thick CRT glass) is somewhat smaller than the physical size of the CRT glass, by an inch or more. In certain states, monitor vendors as well as retailers are required to report

each monitor's viewable image area in their marketing materials. Since this requirement may tend to confuse buyers, many vendors have renamed their products so as not to explicitly reference the CRT size.

To provide the best information to

help you make your buying decision, we measured the viewable area of each monitor's CRT when it was displaying a 1,024-x-768-pixel image generated through a Microvision SuperSpot 200, a fully automated monitor-testing system that measures the sharpness, pincushion distortion, and geometric alignment of each monitor by using a suite of objective, repeatable tests.

On each monitor, we made a reasonable attempt to maximize the image size without causing undue pincushion distortion. The measurements ranged from 15.4 to 16.2 inches, a difference that may sound small, but keep in mind that a larger image area allows for slightly better image clarity and improved overall readability.

Maximum Resolution. In considering the maximum resolution a monitor supports, keep in mind that achieving a given resolution requires capabilities on both ends: your Mac system's and the monitor's. All the monitors featured in this roundup are *autosynchronous*, meaning that they can synchronize to just about all the *vertical-scan rates* of the various resolutions your Mac OS system's built-in display circuitry (or the added circuitry of a graphics card) can provide — the higher the vertical-scan rate, the less the image will flicker. However, although all the display systems can support the Mac's basic 640-x-480-pixel resolution — mandatory for playing many game and multimedia titles — not all can support the

smart shopper

5 questions to ask when you're shopping for a monitor:

1. Is a Mac adapter in the box or available on request — and can I return or exchange the monitor if it doesn't work with my Mac?
2. If the monitor breaks, can you have me up and running quickly with a replacement?
3. What's the maximum resolution of this monitor with my Mac system (including any added graphics card)?
4. Is calibration software such as Sonnetech's Colorific bundled with the monitor?
5. Does the screen have an antireflective coating?



COMMON SCAN RATES

RESOLUTION	VERTICAL-SCAN RATE	HORIZONTAL-SCAN RATE
640 x 480 pixels	66.7 Hz	35.0 kHz
832 x 624 pixels	74.6 Hz	49.7 kHz
1,024 x 768 pixels	74.9 Hz	60.2 kHz
1,152 x 870 pixels	75.1 Hz	68.7 kHz
1,280 x 1,024 pixels	75.0 Hz	80.0 kHz
1,600 x 1,200 pixels	68.7 Hz	85.2 kHz

CRT TYPES / *several ways to make displays*

PICTURE A BEAKER MADE OF THICK GLASS, with an electron gun in its neck, shooting beams through a mask or grille just above the beaker's bottom, which is coated on the inside with phosphors that emit red, green, and blue light. Now turn it on its side so the bottom becomes a monitor's screen — that's your basic CRT, or cathode-ray tube.

The four types of CRTs currently used in computer monitors — shadow-mask, aperture-grille (Trinitron or DiamondTron), Cromaclear (slotted shadow-mask), and Pure Flat (flat, slotted shadow-mask; on the horizon at press time) — all share this basic description and work in much the same way. In each case, the electron gun shoots three beams (one to elicit red light, one green, and one blue) rapidly across and down the screen, row by row, with an electromagnetic yoke deflecting the beams in sync with the horizontal and vertical scan rates provided by your Mac's video circuitry. And in each case, the alignment of the openings in the mask or grille with the phosphor pattern on the inside of the screen is critical to ensuring that each beam strikes phosphors of the appropriate color (at which point, they emit light of that color in proportion to the strength of the beam at that moment).

The differences among CRT types lie mainly in three areas: the type of electron gun, the pattern of mask or grille openings (and phosphors), and the roundness or flatness of the screen.

Gun-Assembly Type. The three guns within an electron-gun assembly can be arranged in either a triangular fashion or an in-line pattern (a straight line), with the latter generally providing better beam alignment, for greater image clarity. Shadow-mask CRTs can have either type of assembly. All aperture-grille tubes use an in-line gun — Sony's Trinitron gun uses a single-focus lens, however. Both NEC's Cromaclear and Matsushita's Pure Flat CRTs use in-line electron guns.

Mask or Grille Type. This characteristic varies greatly among the four types of CRTs.

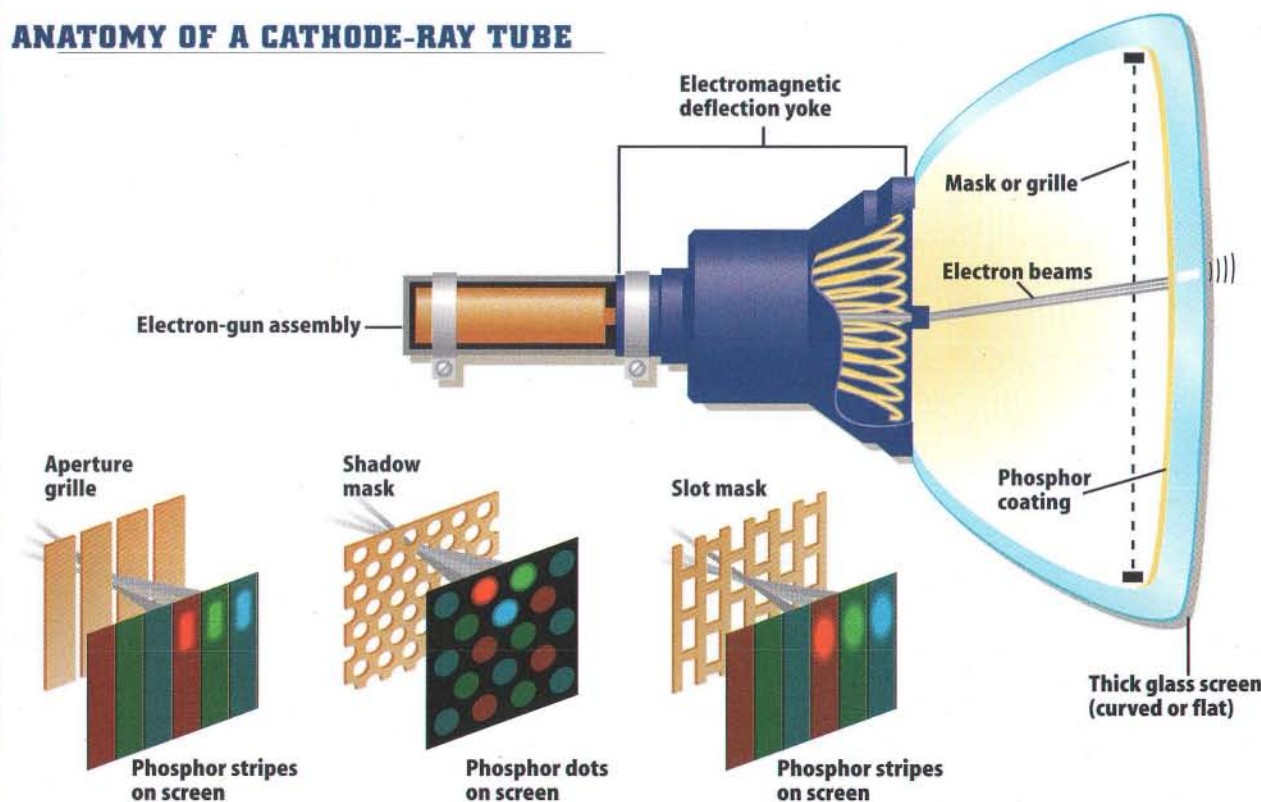
In a shadow-mask tube, the mask is a thin plate of metal riddled with tiny holes and each trio of phosphors is arranged in a triangular dot pattern; the angle at which each beam passes through each hole dictates whether it strikes a red, green, or blue dot.

In an aperture-grille tube, the grille is an array of thin, tightly stretched vertical wires; the beams pass between them to strike red, green, or blue vertical phosphor stripes. Two horizontal wires (one-third of the way from the top and from the bottom) prevent vibration of the wires, which could cause alignment problems.

The Cromaclear CRT has a shadow mask with slots cut into it, rather than holes, so that more electrons can pass through, and its phosphor coating is patterned in stripes rather than dots. The larger phosphor area and larger shadow-mask openings for every beam are intended to provide greater brightness than in a traditional shadow-mask design.

The Pure Flat CRT uses a flat tension mask — a slotted shadow mask kept under tension in a precisely aligned frame within the CRT. Alignment is critical in a flat-screen, flat-mask design, since the distance of the electron guns from parts of the screen is more variable. **Screen Shape.** In general, the flatter the screen, the less likely you are to see distortion and glare — and the more likely you are to need extremely precise alignment. The screens of shadow-mask CRTs tend to have some spherical curvature (think of the curvature at the end of a light bulb), with the better ones being closer to flat. The screens of aperture-grille CRTs have a slight cylindrical curvature (vertically flat but curved horizontally), which produces less glare than a spherical curvature. Cromaclear CRTs have "semiflat" spherical screens similar to those on better (and more expensive) shadow-mask CRTs. And the Pure Flat CRTs, as the name indicates, feature a perfectly flat screen, for the least glare of any CRT design.

ANATOMY OF A CATHODE-RAY TUBE



BBEdit 4.0

"...deserves a place in everyone's HTML toolkit."

-MacUser, August 1996



BBEdit Stands Alone

BBEdit is the tool of choice for web page designers because it offers so many powerful features. As an HTML editor, BBEdition offers HTML keyword coloring, drag and drop HTML tools, an HTML-aware spelling checker, and multiple undos. As a web site manager, BBEdition can directly "Open From..." and "Save To..." FTP servers, compare the contents of files and folders, and perform unrivaled multi-file search and replace commands.

BBEdit Works Well with Others

BBEdit also works well with other applications and environments. BBEdition is AppleScript savvy, and is fully integrated with Frontier 4.0 to perform a suite of valuable web-authoring scripts. BBEdition includes tools to check your HTML syntax, so you can use it to proofread code generated by graphical HTML applications. BBEdition is also easily expanded to support new HTML conventions as they hit the scene.

BBEdit is Generous

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highest resolution your Macintosh system can provide. To be certain a particular monitor meets your needs, check the specs for your Mac's or card's upper limit. Older, NuBus Macs support resolutions of up to 1,152 x 870 pixels (at a vertical-scan rate of 75.1 Hz and a horizontal-scan rate of 68.7 kHz); today's PCI Macs support resolutions of up to 1,280 x 1,024 pixels (at a vertical-scan rate of 75 Hz and a horizontal-scan rate of 80 kHz). Many graphics cards support a resolution of 1,600 x 1,200 pixels (usually at a vertical-scan rate of 68.7 Hz and a horizontal-scan rate of 85.2 kHz). If you are planning to use higher resolutions, we recommend that you shop around for an accelerated-graphics card that supports high scan rates, in order to minimize flicker.

Scan Rates. The vertical- and horizontal-scan rates generated by your Mac's video circuitry — and your monitor's support of these rates — are what allow your monitor to achieve a particular resolution. When you choose a resolution in the control strip or in the Monitors control panel, your Mac's video circuitry generates corresponding scan rates. The vertical-scan rate, often called the refresh rate, is the number of times each image is displayed on the screen per second; because flicker is readily apparent at low vertical-scan rates, we don't recommend rates much below 65 Hz. The horizontal-scan rate dictates how many horizontal lines each image contains. In looking at the range of scan rates for a given monitor, make sure the rates for the resolutions you typically use are

supported. The "Common Scan Rates" table lists some scan rates corresponding to typical resolutions.

Dot Pitch. As the "CRT Types" illustration shows, a monitor's image is composed of varying amounts of red, green, and blue light emitted from a fine array of phosphor dots or stripes painted on the inside of the screen. *Dot pitch* (the conventional term, although *stripe pitch* is more accurate in some cases) is a measurement of the fineness of this phosphor pattern. Typically, a finer (smaller) dot pitch results in a sharper image, all other characteristics being equal.

Tube Type. Although tube type — whether the CRT has an aperture-grille, shadow-mask, or slot-mask design (see the "CRT Types" sidebar) — is definitely a characteristic you'll want to understand as you shop for display systems, it's no longer as important a buying factor as it used to be. In the past, CRTs that had an aperture-grille design, such as the Sony Trinitron and Mitsubishi DiamondTron tubes, used to be brighter than shadow-mask tubes and have more-even brightness and color; with today's advanced shadow-mask-tube technology, however, this distinction is no longer true.

In our testing, we found no correlation between tube type and color- and brightness-uniformity scores. In general, aperture-grille tubes still produce less glare than shadow-mask tubes, because of their cylindrical — rather than spherical — tube type. Shadow-mask tubes, on the other hand, can be better for line drawing and working with small

type, because their round-dot pattern produces even sharpness for horizontal and vertical lines — and because the two horizontal wire shadows faintly visible on an aperture-grille screen (one-third of the way from the top and the bottom of the screen) can sometimes be distracting to some users.

As far as NEC's new, slot-mask-design ChromaClear tube (featured in the MultiSync M700 in this roundup) is concerned, we found its main advantage to be sharpness. The M700 had the best MTF Sharpness score of any monitor we tested. However, its brightness — another supposed advantage of the new tube type — although good, was not exceptional. Color uniformity across the surface of the M700's CRT was not so great, but this problem is typical of any new CRT design, as manufacturers strive to perfect the precision of mask and phosphor alignment.

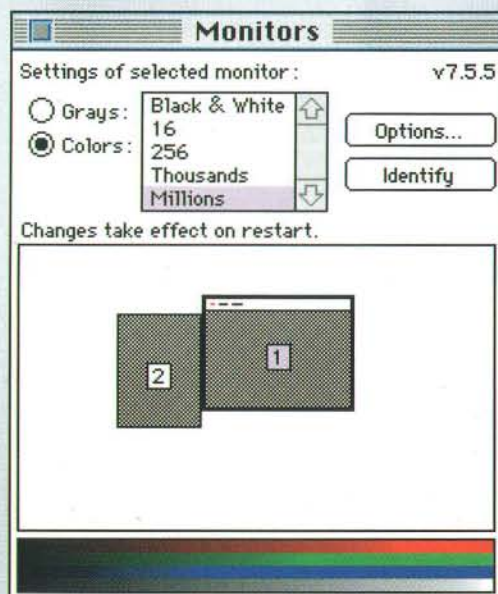
Controls. The type of controls a monitor offers can significantly affect its ease of use. All the monitors in this roundup feature digital controls that remember your settings for a particular resolution. The better monitors feature on-screen menu-driven controls, which reduce the number of buttons required for making certain adjustments and also provide you with some help and feedback on the adjustments you make. Some of the control features on these monitors are quite esoteric and can be difficult to adjust. Before you use the digital controls on these monitors, check the manual to find out which button returns the monitor to its factory-default settings. Corporate sites may

SEEING DOUBLE / *the two-monitor advantage*

ATTRACTIVE AS IT IS AS A FIRST MONITOR, a 17-inch monitor can be even more enticing to Mac users as a second monitor — thanks to an important feature of the Mac OS that's not available with Windows. Multiple-monitor support has been part of the Mac OS since the Mac SE and provides Mac users with significantly more flexibility than Windows users in arranging their screen real estate.

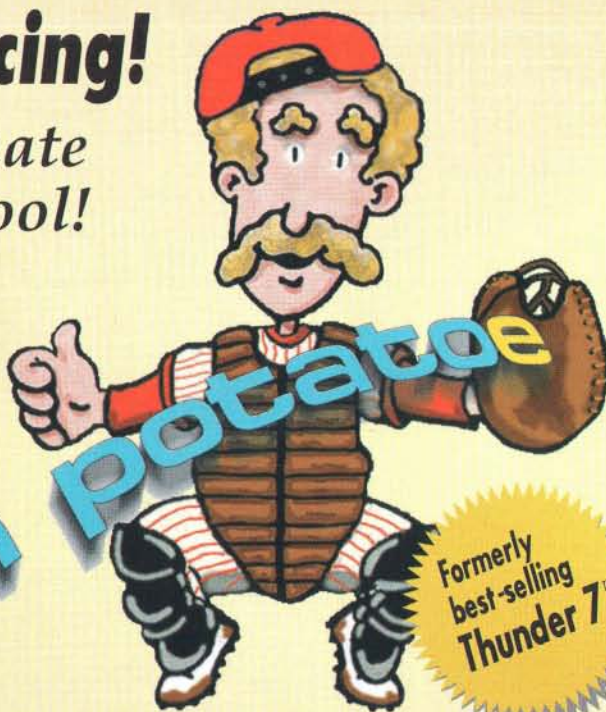
If your Mac already has a monitor — even if it's an all-in-one Performa — you can still use a 17-inch display system as a second monitor, providing you have the free desk space and your Mac has an available expansion slot for the add-in graphics card (available for as little as \$200) required to drive the additional monitor.

Many designers are opting for a 17-inch display for their work space and a 14-inch display for their tools and palettes. This arrangement allows for as much on-screen work space as a 21-inch display provides but has the sharpness advantages that come with smaller CRT sizes. Even for business use, a two-monitor setup is handy (as many of us at *MacUser* can attest): You can keep your e-mail, calendar, and other organizational tools easily accessible on your 14-inch display while you use your 17-inch display for your word-processing, spreadsheet, and other productivity applications.



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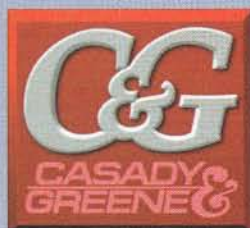
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want to check out monitors such as the NEC MultiSync M700, which lets managers lock out all controls until users press a special key sequence (listed in the manual).

Mac-Readiness. Whether a Macintosh cable or adapter is included is also an important consideration. All the monitors we tested are

Mac-compatible when connected via either a Mac video cable or a PC VGA cable and Mac adapter. Each of these Mac cables or adapters comes prewired with (or has switches for selecting) sense codes that tell the Mac OS which resolutions and refresh rates are compatible with the monitor. As a compatibility

safeguard, the Mac OS allows you to select only the resolutions and refresh rates it's sure are compatible with your monitor. Since all these monitors are autosynchronous, all should work well with a Mac if you have the right adapter, but you may have to do a bit of trial-and-error adjusting of adapters or

FEATURES OF 17-INCH MONITORS

PRODUCT	RATING	LIST PRICE	EST. STREET PRICE	PARTS, LABOR WARRANTY	CRT WARRANTY	CROSS-SHIP REPAIR POLICY	ACTIVE SCREEN SIZE (DIAG.)
AcerAcerView 78ie	★★★★	NA	\$799	1 year, 1 year	1 year	●	15.6 in.
ADI MicroScan 5V**	★★★★	\$899	\$739	3 years, 3 years	3 years	●	15.9 in.
Apple AppleVision 1710 Display	★★★★	\$1,039	\$970	1 year, 1 year	none		16.1 in.
Compaq V70	★★★★	NA	\$730	3 years, 3 years	3 years		15.6 in.
CTX PR700	★★★★	\$999	\$899	3 years, 3 years	2 years		16.2 in.
CTX VL700	★★★★	\$775	\$660	3 years, 3 years	2 years		16.0 in.
Daewoo CMC-1703B	★★★★	\$799	\$700	3 years, 3 years	3 years	●	15.8 in.
Delta DB-176SEA	★★★★	\$799	\$699	2 years, 2 years	2 years	●*	15.9 in.
EIZO Nanao FlexScan TX-C7S	★★★★	\$1,125	\$1,299	3 years, 3 years	3 years	●	15.9 in.
EIZO Nanao FlexScan T2-17TS	★★★★	\$1,299	\$1,150	3 years, 3 years	3 years	●	15.8 in.
Hitachi Accuvue GX17L	★★★★	\$765	\$765	1 year, 1 year	1 year	●†	16.0 in.
Hyundai DeluxScan 17B	★★★★	\$649	\$599	3 years, 1 year	3 years	●	15.8 in.
Iiyama VisionMaster Pro 17	★★★★	\$949	\$850	3 years, 3 years	3 years	●	15.9 in.
KDS Visual Sensations VSx-7	★★★★	\$649	\$599	3 years, 1 year	2 years	●	15.8 in.
LG Electronics GoldStar Studioworks 76i	★★★★	\$799	\$699	3 years, 3 years	3 years		16.0 in.
LG Electronics GoldStar Studioworks 78m	★★★★	\$999	\$869	3 years, 3 years	3 years		16.0 in.
MAG InnoVision DJ702	★★★★	\$859	\$829	3 years, 1 year	2 years		16.1 in.
MAG InnoVision DX700T	★★★★	\$799	\$700	3 years, 1 year	2 years		16.0 in.
Magnavox CM4018	★★★★	\$749	\$699	1 year, 3 years	3 years		16.1 in.
ManTech InSync 1726	★★★★	\$699	\$670	3 years, 3 years	3 years	●	16.0 in.
Mitsubishi Diamond Scan 17HX	★★★★	\$849	\$815	3 years, 3 years	3 years		15.6 in.
NEC MultiSync M700	★★★★	NA	\$899	3 years, 3 years	3 years	●	15.4 in.
NEC MultiSync XV17+	★★★★	NA	\$850	3 years, 3 years	3 years	●	15.5 in.
Nokia Multigraph 447Xav	★★★★	\$999	\$999	3 years, 3 years	3 years	●	15.6 in.
Nokia Multigraph 447Xi	★★★★	\$899	\$850	3 years, 3 years	3 years	●	15.6 in.
NSA/Hitachi RasterOps Mc 17	★★★★	\$999	\$899	3 years, 3 years	3 years		15.8 in.
NSA/Hitachi SuperScan Elite 17	★★★★	\$999	\$899	3 years, 3 years	3 years	○	15.8 in.
Pacom Data Display 7Fgs	★★★★	\$749	\$650	3 years, 3 years	3 years	●	15.7 in.
Panasonic PanaSync Pro P17	★★★★	\$949	\$799	3 years, 3 years	3 years	●	16.1 in.
Panasonic PanaSync S17	★★★★	\$799	\$649	3 years, 3 years	3 years	●	16.0 in.
PiXie PBC-1764	★★★★	\$699	\$599	3 years, 3 years	3 years	●†	15.9 in.
Princeton E017	★★★★	\$621	\$599	3 years, 3 years	3 years		15.8 in.
Princeton Ultra 70F	★★★★	\$599	\$543	1 year, 1 year	1 year		15.9 in.
Princeton Ultra 17+	★★★★	\$629	\$600	3 years, 1 year	2 years		15.4 in.
Sampo AlphaScan 760	★★★★	\$899	\$829	3 years, 3 years	3 years	●	16.1 in.
Samsung SyncMaster 17GLi	★★★★	\$829	\$759	3 years, 3 years	3 years	●	15.7 in.
Samtron SC-726GXL	★★★★	\$899	\$819	3 years, 3 years	2 years		15.8 in.
Sceptre P73	★★★★	\$849	\$750	3 years, 1 year	3 years		15.8 in.
SIGMA Ergoview 170	★★★★	\$999	\$800	1 year, 1 year	1 year		15.4 in.
Smile CB1716SL	★★★★	\$699	\$619	3 years, 1 year	2 years	●	16.0 in.
Sony Multiscan 17sfil	★★★★	\$879	\$800	3 years, 1 year	2 years	●	16.0 in.
✓ Sony Multiscan 17sell	★★★★	\$1,099	\$1,000	3 years, 1 year	2 years	●	15.8 in.
techmedia TCM-1700G	★★★★	\$699	\$585	3 years, 3 years	1 year		15.5 in.
ViewSonic Optiquest V775	★★★★	\$699	\$665	3 years, 3 years	3 years	●	16.0 in.
✓ ViewSonic 17EA	★★★★	\$699	\$645	3 years, 3 years	3 years	●	15.9 in.
ViewSonic PT770	★★★★	\$895	\$849	3 years, 3 years	3 years	●	16.0 in.
WYSE WYSEvision WY-17PS	★★★★	\$995	\$920	3 years, 3 years	3 years		16.2 in.

✓ MacUser BEST BUY

*First 90 days only.

†First 30 days only.

§Specify Mac model when ordering.

○Extra cost.

**Compatible with PowerPC-based Macs only.

their switch settings for monitors for which the responsibility of providing adapters is left to resellers. For this reason, we recommend buying your monitor from a vendor that includes a Mac cable or adapter in the box or sends it free on request — or from a reseller that offers a money-back guarantee.

Also, if you're buying a monitor for a non-PowerPC-based Macintosh or a Macintosh that contains an older graphics card, make sure it can handle *sync on green* (horizontal and vertical synchronization signals on the same wire as the green color signal). With PowerPC-based Macs, the signals are all on

separate wires, just as they are with PCs.

Glare Protection. Monitors also vary in the type of glare protection they offer. The simplest is nothing more than a darkened glass, which does not reduce glare but does increase contrast. Darkened glass is used on practically every display, in combination

MAXIMUM RESOLUTION	VERTICAL-SCAN RATES	HORIZONTAL-SCAN RATES	DOT PITCH	TUBE TYPE	ON-SCREEN CONTROLS	MAC ADAPTER INCLUDED FREE
1,280 x 1,024 pixels @ 80 Hz	50 – 120 Hz	30 – 86 kHz	.26 mm	shadow-mask	●	
1,024 x 768 pixels @ 76 Hz	50 – 100 Hz	30 – 64 kHz	.26 mm	shadow-mask	●	
1,280 x 1,024 pixels @ 75 Hz	50 – 120 Hz	30 – 80 kHz	.26 mm	Trinitron	●	●
1,024 x 768 pixels @ 85 Hz	50 – 100 Hz	32 – 69 kHz	.28 mm	shadow-mask	●	●
1,600 x 1,200 pixels @ 65 Hz	50 – 120 Hz	30 – 85 kHz	.26 mm	DiamondTron	●	●
1,280 x 1,024 pixels @ 66 Hz	50 – 120 Hz	30 – 85 kHz	.28 mm	shadow-mask	●	●
1,024 x 768 pixels @ 75 Hz	47 – 120 Hz	30 – 64 kHz	.28 mm	shadow-mask	●	
1,024 x 768 pixels @ 60 Hz	50 – 100 Hz	30 – 65 kHz	.28 mm	shadow-mask	●	
1,360 x 1,024 pixels @ 86 Hz	50 – 160 Hz	30 – 69 kHz	.27 mm	Trinitron	●	
1,280 x 1,024 pixels @ 82 Hz	55 – 160 Hz	30 – 86 kHz	.26 mm	DiamondTron	●	●
1,024 x 768 pixels @ 60 Hz	50 – 100 Hz	30 – 64 kHz	.28 mm	shadow-mask		
1,280 x 1,024 pixels @ 60 Hz	45 – 130 Hz	30 – 65 kHz	.28 mm	shadow-mask	●	
1,600 x 1,200 pixels @ 72 Hz	50 – 160 Hz	27 – 92 kHz	.26 mm	Trinitron	●	
1,024 x 768 pixels @ 75 Hz	50 – 120 Hz	28 – 70 kHz	.28 mm	shadow-mask	●	
1,152 x 870 pixels @ 75 Hz	50 – 110 Hz	30 – 65 kHz	.28 mm	shadow-mask	●	
1,152 x 870 pixels @ 75 Hz	50 – 120 Hz	30 – 85 kHz	.26 mm	shadow-mask	●	
1,152 x 870 pixels @ 75 Hz	50 – 160 Hz	30 – 69 kHz	.26 mm	shadow-mask	●	● ^{\$}
1,152 x 870 pixels @ 75 Hz	50 – 100 Hz	30 – 70 kHz	.25 mm	Trinitron	●	● ^{\$}
1,024 x 768 pixels @ 75 Hz	50 – 130 Hz	30 – 66 kHz	.28 mm	shadow-mask	●	
1,024 x 768 pixels @ 85 Hz	50 – 90 Hz	30 – 66 kHz	.28 mm	shadow-mask		
1,280 x 1,024 pixels @ 75 Hz	50 – 130 Hz	30 – 82 kHz	.26 mm	shadow-mask	●	●
1,152 x 870 pixels @ 55 – 75 Hz	55 – 120 Hz	31 – 69 kHz	.25 mm	slot-mask	●	●
1,152 x 870 pixels @ 55 – 75 Hz	55 – 100 Hz	31 – 65 kHz	.28 mm	shadow-mask	●	●
1,600 x 1,200 pixels @ 72 Hz	50 – 150 Hz	31 – 82 kHz	.25 mm	Trinitron	●	●
1,600 x 1,200 pixels @ 72 Hz	50 – 150 Hz	31 – 91 kHz	.26 mm	Trinitron	●	●
1,600 x 1,200 pixels @ 74 Hz	50 – 120 Hz	25 – 82 kHz	.26 mm	shadow-mask	●	●
1,280 x 1,024 pixels @ 75 Hz	50 – 120 Hz	25 – 82 kHz	.26 mm	shadow-mask	●	
1,280 x 1,024 pixels @ 66 Hz	50 – 120 Hz	30 – 65 kHz	.28 mm	shadow-mask	●	
1,600 x 1,200 pixels @ 75 Hz	50 – 160 Hz	30 – 86 kHz	.25 mm	shadow-mask	●	
1,024 x 768 pixels @ 75 Hz	50 – 160 Hz	30 – 69 kHz	.27 mm	shadow-mask	●	
1,024 x 768 pixels @ 85 Hz	47 – 120 Hz	30 – 64 kHz	.28 mm	shadow-mask	●	
1,152 x 870 pixels @ 75 Hz	50 – 120 Hz	30 – 70 kHz	.26 mm	shadow-mask	●	● ^{\$}
832 x 624 pixels @ 75 Hz	50 – 120 Hz	30 – 65 kHz	.28 mm	shadow-mask	●	● ^{\$}
1,152 x 870 pixels @ 75 Hz	50 – 120 Hz	30 – 82 kHz	.28 mm	shadow-mask	●	● ^{\$}
1,152 x 870 pixels @ 75 Hz	50 – 120 Hz	30 – 82 kHz	.25 mm	DiamondTron	●	
1,280 x 1,024 pixels @ 60 Hz	50 – 120 Hz	30 – 65 kHz	.28 mm	shadow-mask	●	●
1,600 x 1,200 pixels @ 68 Hz	50 – 120 Hz	30 – 85 kHz	.26 mm	shadow-mask	●	●
1,280 x 1,024 pixels @ 75 Hz	50 – 110 Hz	30 – 66 kHz	.28 mm	shadow-mask	●	
1,600 x 1,200 pixels @ 65 Hz	50 – 120 Hz	30 – 82 kHz	.27 mm	shadow-mask		
1,024 x 768 pixels @ 76 Hz	50 – 100 Hz	30 – 65 kHz	.26 mm	shadow-mask	●	●
1,024 x 768 pixels @ 75 Hz	50 – 120 Hz	31 – 65 kHz	.25 mm	Trinitron		●
1,280 x 1,024 pixels @ 75 Hz	48 – 150 Hz	30 – 85 kHz	.25 mm	Trinitron	●	●
1,152 x 870 pixels @ 75 Hz	47 – 104 Hz	30 – 64 kHz	.28 mm	shadow-mask	●	
1,600 x 1,200 pixels @ 66 Hz	50 – 130 Hz	24 – 82 kHz	.26 mm	shadow-mask	●	
1,024 x 768 pixels @ 85 Hz	50 – 120 Hz	30 – 69 kHz	.28 mm	shadow-mask	●	●
1,600 x 1,200 pixels @ 65 Hz	50 – 130 Hz	24 – 82 kHz	.25 mm	Trinitron	●	●
1,600 x 1,200 pixels @ 60 Hz	50 – 120 Hz	24 – 82 kHz	.25 mm	DiamondTron	●	



WELL-MONITORED TESTS / *image quality at a glance*

WHEN YOU SPEND SEVERAL HOURS A DAY staring at a color monitor, you want it to be easy on the eyes — that is, you want bright, accurate color and a sharp, well-focused image. Our overall-image-quality score is a weighted average of tests measuring these characteristics, using two precision testing devices.

We conducted all the monitor tests in a completely black room (in order to prevent ambient light from interfering with the tests), with each monitor set up for its optimal combination of brightness and contrast.

We used a Minolta Color Analyzer CA-100 to measure each monitor's overall brightness; the uniformity of color and brightness across an image; and color tracking, or accuracy, at various brightness levels. The Color Tracking test measures how well each monitor displays color at various brightness levels, by analyzing the amount of red, green, and blue light emitted.

In addition, we used a Microvision SuperSpot 200 to measure MTF

sharpness (the sharpness of a special test pattern consisting of adjacent, single-pixel black and green lines), convergence (alignment of the monitor's three electron beams with each other — also a determining factor in overall sharpness), and pincushion distortion (the tendency of a monitor's displayed image to bow in or out along the sides or at the top or bottom). The MTF-sharpness score is an average of MTF sharpness measured horizontally and vertically at 12 points on the screen.

We are providing the individual results of three of these tests — Color Tracking, MTF Sharpness, and Brightness — because of their respective importance to graphic designers, users who work with text or detailed lines, and users who work in bright environments. In the Color Tracking test, a score of 90 percent or higher is acceptable. Scores that are higher than 50 percent are acceptable in our MTF Sharpness test. And in our Brightness test, a score of 20 footlamberts or more is acceptable.

	OVERALL IMAGE QUALITY	COLOR TRACKING	MTF SHARPNESS	BRIGHTNESS
Apple AppleVision 1710 Display	1.70	93	66	49
EIZO Nanao FlexScan TX-C75	1.62	93	73	35
✓ Sony Multiscan 17sell	1.61	90	78	34
Sony Multiscan 17sfil	1.61	94	74	34
Compaq V70	1.59	90	76	34
✓ ViewSonic 17EA	1.55	93	66	40
MAG InnoVision DX700T	1.54	87	72	43
Samsung SyncMaster 17GLI	1.53	97	73	35
CTX VL700	1.49	88	80	32
ADI MicroScan 5V	1.48	88	73	34
WYSE WYSEvision WY-17PS	1.47	98	76	32
Delta DB-1765EA	1.46	96	63	32
EIZO Nanao FlexScan T2-17TS	1.46	96	75	34
Nokia Multigraph 447Xav	1.46	97	75	29
ViewSonic Optique V775	1.45	93	81	31
LG Electronics GoldStar Studioworks 78m	1.45	94	77	33
NSA/Hitachi SuperScan Elite 17	1.45	84	72	35
Smile CB1716SL	1.45	91	80	31
techmedia TCM-1700G	1.45	81	76	30
ViewSonic PT770	1.44	97	79	30
NSA/Hitachi RasterOps Mc 17	1.43	93	68	34
CTX PR700	1.43	90	66	32
Princeton E017	1.43	93	70	38
Samtron SC-726GXL	1.39	97	62	29
Panasonic PanaSync S17	1.39	93	73	35
Pacom Data Display 7Fgs	1.39	96	65	31
Hyundai DeluxScan 17B	1.38	93	75	28
Iiyama VisionMaster Pro 17	1.38	95	80	25
NEC MultiSync XV17+	1.38	86	69	34
Magnavox CM4018	1.37	97	67	32
Panasonic PanaSync Pro P17	1.36	95	78	32
NEC MultiSync M700	1.35	93	85	28
PIXie PBC-1764	1.35	87	76	28
Acer AcerView 78ie	1.35	96	70	26
Mitsubishi Diamond Scan 17HX	1.34	98	67	35
LG Electronics GoldStar Studioworks 76i	1.34	97	74	29
Sampo AlphaScan 760	1.32	98	75	25
Nokia Multigraph 447Xi	1.32	92	73	31
Sceptre P73	1.32	85	71	27
Daewoo CMC-1703B	1.32	98	62	30
Princeton Ultra 70F	1.31	89	66	28
Hitachi Accuvue GX17L	1.29	95	58	23
Princeton Ultra 17+	1.27	94	63	33
KDS Visual Sensations VSx-7	1.27	89	59	32
MAG InnoVision DJ702	1.26	60	80	29
ManTech InSync 1726	1.24	90	68	24
SIGMA Ergoview 170	1.24	97	66	23

✓ MacUser BEST BUY

■ Best performer(s) in each test

SCORE

BETTER

ACCURACY (percent)

BETTER

MTF (percent)

BETTER

LUMINANCE (footlamberts)

BETTER



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with another antiglare treatment. The least expensive is etching, which means simply that: The glass on the front of the CRT is roughened in order to scatter oncoming light. Slightly more expensive and common on many 17-inch displays is a fine silica coating, which scatters oncoming light much as etching does but with less reduction in sharpness. Most expensive — and more desirable — is an antireflective coating.

Antireflective coatings work by reversing the polarization of light as it passes through the coating and reflects back outward, essentially "canceling out" glare. These coatings are highly effective; however, they must be kept absolutely clean — the oil in your fingerprints is enough to reduce their effectiveness markedly, sometimes producing color-tinged reflections. For this reason, antireflective coatings are not the best option for environments in which children or others who can't resist pointing at the screen by touching it are present.

The Bottom Line

If we made monitor-buying recommendations based solely on image quality, our top choice would be Apple's AppleVision 1710 Display, a superbright monitor that earned the best overall-image-quality score in our tests. When we factored in other considerations such as warranty, repair policy, and price, however, two other monitors were the only ones to earn ratings of four-and-a-half mice and our Best Buy recommendations.

Budget-conscious monitor buyers would be hard-pressed to identify a better choice than the ViewSonic 17EA, with its estimated street price of \$645. Not only did it receive the sixth-highest score for overall image quality but the company also offers a 48-hour cross-ship guarantee in case of failure and a full three-year warranty on parts, labor, and the CRT. As an extra plus, it has built-in speakers.

Users who demand extrasharp, high-resolution images may prefer our other Best Buy, the Sony Multiscan 17seII. With an estimated street price of around \$1,000 and the third-highest overall-image-quality score, the Multiscan 17seII offers a maximum resolution of 1,280 x 1,024 pixels (more than two pages on-screen) at an ergonomically comfortable refresh rate of 75 Hz, with a crisp dot pitch of .25 millimeters and commendable MTF sharpness. Sony too offers a cross-ship repair policy. / JEFF PITTELKAU

DIRECTORY

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800-554-2494 (fax)
<http://www.acer.com/>

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847-228-6271 (fax)
<http://www.dwe.daewoo.co.kr/>

Delta Products

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EIZO Nanao Technologies

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310-431-5011
310-431-4811 (fax)
<http://www.eizo.co.jp/welcome/>

Hitachi America

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510-661-6351
510-661-6317 (fax)
<http://www.hitachi.com/>

Hyundai Electronics America

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408-232-8000
408-232-8146 (fax)
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Iiyama North America

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215-957-6551
215-957-6551 (fax)
<http://www.kom.com/kc/visionmaster/>

KDS USA

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714-379-5599
714-379-5595 (fax)
<http://www.kdsusa.com/>

LG Electronics USA

Englewood Cliffs, NJ
800-243-0000
201-816-2000
201-816-0636 (fax)
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MAG InnoVision

Santa Ana, CA
800-827-3998
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<http://www.maginnovision.com/>

Magnavox

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NEC Technologies

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<http://www.nec.com/>

Nokia Display Products

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415-331-0424 (fax)
<http://www.nokia.com/index.html>

NSA/Hitachi

Westwood, MA
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800-672-4685
617-461-8665 (fax)
<http://www.nsa-hitachi.com/>

Pacom Data

Fremont, CA
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510-440-7200
510-440-7212 (fax)
<http://www.pacomdata.com/>

Panasonic Computer Peripheral

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PiXiE Technologies

Fremont, CA
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510-440-9356 (fax)

Princeton Graphics Systems

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714-751-5736 (fax)
<http://www.pgr.com/>

Sampo Technology

Norcross, GA
770-449-6220
770-447-1109 (fax)

Samsung Electronics America

Ridgefield Park, NJ
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201-229-4000
800-229-2239 (fax)
<http://www.sosimple.com/>

Samtron Display Devices

Ridgefield, NJ
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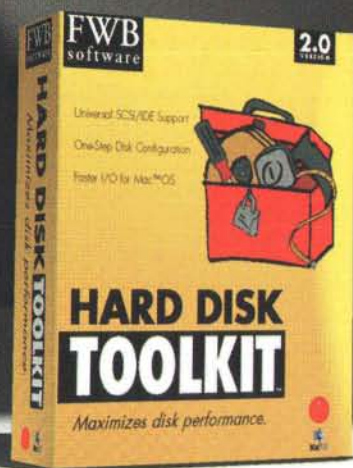
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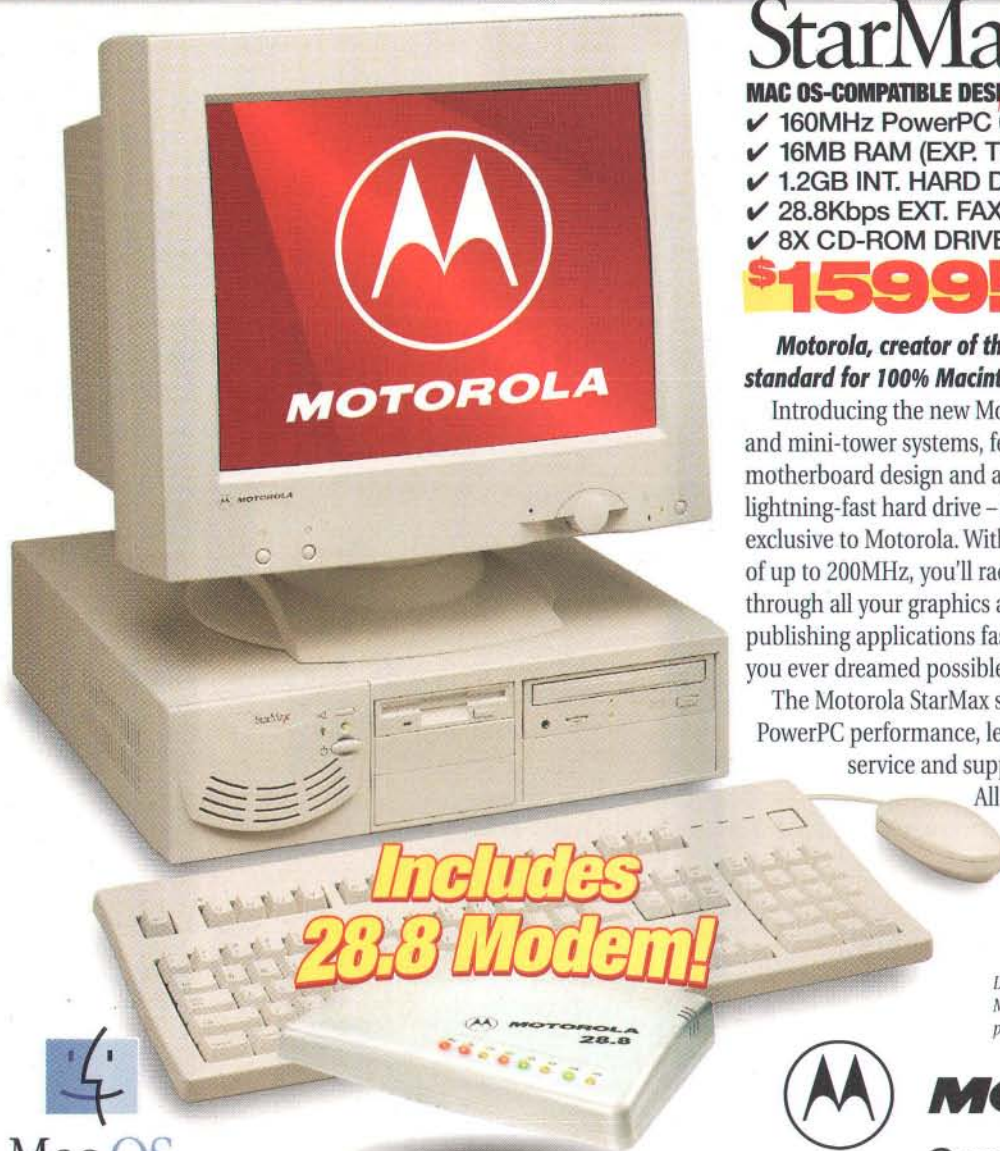


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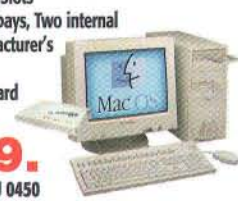
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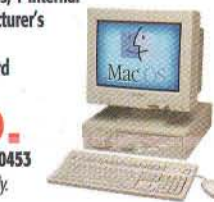
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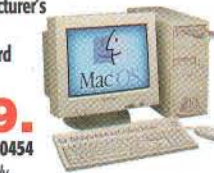
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DESKTOPmedia

Powerful Macs and cheap
video cards make
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By Kennedy Grey

A Desktop-Video Primer

YOU'D LIKE TO ADD a touch of QuickTime to your Web site. Your business presentations could use something more lively than the usual PowerPoint slides. But your video experience is limited to a few hours behind a camcorder in the backyard. You've certainly never used your Mac to capture and edit video, mostly because you're not quite sure what equipment and software you'll need or what it would cost.

We've got good news for you. Today, even standard office computers are video-capable, and QuickTime-based hardware and software make the Mac the best video platform around. On the other hand, assembling a system that balances quality with affordability is a challenge that requires research and patience. This primer is your guide to assembling a Mac-based video-capture and -editing system that will make you look like a star.

Pieces of the Puzzle

Whether you plan to use an existing Mac for video production or to dedicate a new system to the task, you have a few decisions to make. Besides the Macintosh, you'll need video-capture/compression hardware, a fast storage device, and some editing software.

A Mac. The object of a Mac-based video system is to get video images into the Mac, where you'll edit them and add effects to create your movie or presentation. To do this, you need a way to *digitize* — capture — images from videotape to disk. A few Macs include this capability, and others can do it with the help of a NuBus or PCI video-capture card.

Apple's best off-the-shelf video workstations, the Power Mac 7500 and the Power Mac 8500, include video-capture hardware on the motherboard and also sport a selection of video-input ports (composite, S-Video, and RCA). Each system can capture images at 320 x 240 pixels and at 25 to 30 frames per second. The 8500 also includes video-out capability, allowing you to display your movies on a television monitor or record your edited footage to videotape once your project is completed. Several AV Macs, including the discontinued Quadra 840AV and the Power Mac 8100AV system, can capture images at 160 x 120 pixels and at roughly 30 frames per second.

Power Computing's PowerTower AV systems are another ready-made video option. Rather than having built-in digitizing hardware and input/output ports, each includes a microMotion DC20 video card, which is able to

capture full-screen images at 640 x 480 pixels and at 30 frames per second. The card includes VHS and S-Video input and output ports. Such a system also includes a fast hard drive and a scaled-down version of Adobe Premiere editing software, all of which starts at around \$4,000.

If you plan to turn a Mac you already own into a video studio, you'll need at least one free NuBus or PCI slot (for the capture card) and a minimum of 16 MB of RAM. You can capture video with this relatively modest complement of memory, but you'll want 32 MB or more if you plan to do any serious editing.

If you're ready to splurge on a new system, apply the usual rule of thumb: Get the best CPU you can afford. Serious Mac video makers should opt for a Mac or clone with a PowerPC 604 processor and a minimum of three expansion slots, for video cards and a disk-array card.

Capture Cards. Unless you're planning to use a preconfigured AV machine, the next item in your shopping basket should be a video-capture card. There are three varieties of Mac-compatible cards: QuickTime; proprietary; and the Data Translation Media 100, which straddles the fence.

Cards that use proprietary technology are usually found at the professional end of the digital-video spectrum — and at the high end of the price range. Proprietary systems flourished, until recently, because QuickTime did not offer stable audio/video synchronization or adequate video-playback speed. Today, QuickTime-based cards are where the real action is for most Mac users, offering quality comparable to that of proprietary systems — at a fraction of the cost. You'll find a wide array of choices and price points, from the affordable to the professional. These cards also support the many QuickTime-capable video, animation, and effects packages currently available.

You can capture good-quality images for less than a thousand dollars or spend several times that amount for video that can pass muster in the broadcast world. The differences in cards are manifested mainly in data throughput, support for video standards, and card design.

The secret to moving large amounts of data (raw video generates 27 MB per second) is compression. As it is captured, video cards compress data at a rate that is determined by the card's maximum throughput. Higher throughput means less compression will be needed and your images will look better. S-VHS and Hi-8 video (two high-quality consumer formats) require a card with throughput of at least 3 MB per second. Professional-quality capture requires throughput of 5 MB or more per second. The miro DC20

card, found in Power Computing's AV machines and sold on its own for \$799, moves data at 3.5 MB per second, making it a good choice for simple Web and presentation videos. At \$3,995, the Truevision Targa 1000pro probably seems rather pricey, but its speedy 5-MB-per-second throughput and its support for a variety of video formats make it a bargain for those who need to create high-quality video for CD-ROM and presentation projects.

Beyond compression and throughput, your chosen video card must support the video format your VCR or camera does. Most cards offer ports for composite-video and S-Video. These video formats are adequate for multimedia presentations but don't approach the quality of component video. Component video uses separate inputs for red, green, and blue — the three colors of the RGB color space. Component-video support is usually found only on high-end cards intended to support professional VCR and camera equipment. Whatever card you choose,

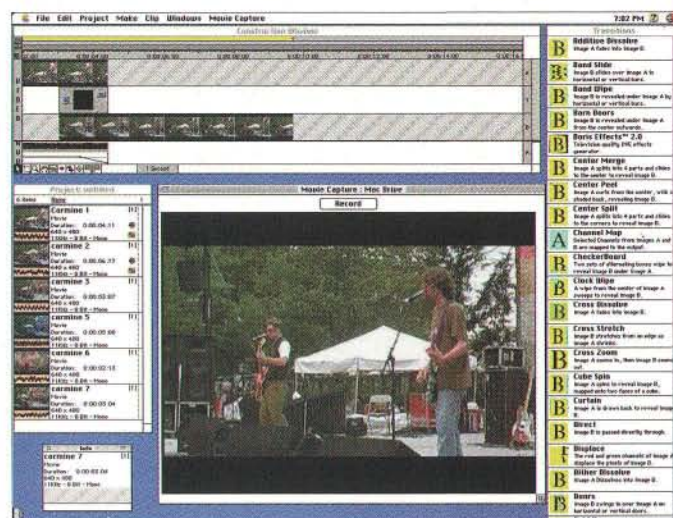


figure 1 / The four main elements of a video-editing package are included in Adobe Premiere. Clockwise from the top: The Construction Window holds images of video clips in the proper order and is the place where music and graphics are added. The Transitions window lets a producer add dissolves, wipes, and special effects. The Movie Capture window contains the live video signal. Once captured, clips move into the Project window, which provides statistics about each clip, including duration, aspect ratio, and audio-quality ratings.

be sure that its video ports match those of your VCR or camera.

High-end video cards also frequently feature a breakout box, an external device that contains video ports. Using a breakout box, you can better organize the maze of cables connecting your Macintosh to your video equipment and prevent the cables' combined weight from dislodging the board from the computer.

Most video cards also include software, often a limited version of Adobe Premiere. Premiere (see figure 1) dominates the market for video editing on the Macintosh. Premiere features an industry-standard plug-in architecture that supports many third-party filters and effects. There's also an excellent title and keying feature (which allows text animation) and a comprehensive motion-effects window that is able to animate alpha-channel graphics or whole screens including elaborate spins, rolls, and keyframe motion created by the user.

Like QuarkXPress and Adobe PageMaker in the publishing world, video-editing software provides a pasteboard on which you manipulate, rearrange, and enhance images to produce a complete movie. Since video-editing software works together with time-based media, the pasteboard is dynamic — instead of using a blank page, video packages employ a timeline metaphor. Once you have

Better Movies / tips for trouble-free desktop video

YOU WANT YOUR EXPERIENCE creating digital video to be as headache-free as possible, right? Here are a few tips for avoiding trouble:

- Make sure you are using the latest version of the Mac OS (7.5.3) and QuickTime (2.5) as well as of your editing/capture application. Performance improvements and better compatibility will be your rewards.
- Tone down your menu bar. Turn off any extensions or control panels that modify the menu bar, such as the clock display created by the Date & Time control panel. Small as they are, these extensions compete with video-editing software for needed resources.
- Turn off AppleTalk, virtual memory, and RAM enhancers such as RAM Doubler. These interfere with QuickTime's ability to capture and play back smoothly.
- Keep your hard disk defragmented. No matter what you're doing with your Mac, proper hard-disk hygiene is essential. Use Symantec's MacTools or Norton Utilities (preferably both) to check,

defragment, and optimize the disk you're using to record video images. DiskExpress, from Alsoft, automatically optimizes your disks when you're not using the machine.

- Use the highest-quality input available. The S-Video connector on your Mac provides a better signal than the RCA-style composite-video connector.
- Turn off sound capture. You'll get better performance if you capture only the video signal. Capture the audio later, and then combine it with video to create your final clip. If you do decide to capture audio and video together and you're using a Power Mac, set it to capture 44-kHz, 16-bit-stereo audio. Sound Manager 3.0 and later versions are optimized for this setting.
- Buy more hard drives. Digital video can quickly fill a disk. Run the OS and the editing software on the built-in drive that came with your Mac, and use your new hard disk as the scratch disk for recording.

/ JEFFY MILSTEAD

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captured video clips from tape, you can fill the timeline with clips that will form the final movie. Also, like desktop-publishing tools, video-editing software is able to mingle a variety of digital-media formats, from still images to animation and from audio to special effects.

More Megabytes. Perhaps the most overlooked component in the video chain is the primary storage system: the hard drive or drives you will use to capture, save, and play your video footage. Once again, throughput is the most important consideration when choosing a drive. *Sustained throughput* is a measurement of the amount of data a drive can transfer on a continuing basis. Many drive vendors sell high-performance storage systems intended for video. These drives boast sustained throughput rates that are much higher than those of typical Mac hard drives. Video-card vendors typically recommend that the throughput of your hard drive be somewhat faster than that of your video card. On the other hand, adding a lightning-fast disk array to a system that includes a 3.5-MB-per-second video card is probably overkill. miro, maker of the miroMotion DC20, recommends that your drive's (or array's) throughput be 50 percent above that of your card.

You can test a disk drive to determine whether or not it has the sustained throughput to stand up to the rigors of desktop video. With your Mac video setup in place and Adobe Premiere installed, capture some video footage to the drive you'd like to test. First, tell Premiere to report dropped frames. If you lose frames during the capture, try recording your footage at a lower data rate. If your first capture did not drop any frames, increase the data rate until some frames do drop. When you reach the highest data rate your drive can handle, play your movie back at the same rate, to verify the quality of your recording and, therefore, the data rate supported by your drive.

Video footage takes up lots of space, and the higher your throughput, the less the compression applied to your video and the more disk space your movie will require. A drive with sustained throughput of 3 MB per second will use 180 MB of disk space to store a one-minute video clip. With drive prices low, it pays to invest in a multigigabyte drive. You'll find 4-GB drives for less than \$1,000 and 9-GB drives for less than \$2,000.

If you intend to work with component-quality video (which usually delivers 5 MB

per second of data), a disk array is essential. Disk arrays divide the data stream between two or more drives, effectively multiplying your capture and recording speed. Disk arrays use a PCI card to manage the data streams, so you'll need a spare slot in your Macintosh. Some arrays deliver 40-MB-per-second sustained throughput, which is far above the throughput of most video cards. The latest trend in mass storage for video is removable storage. Removable hard-disk arrays and Jaz arrays are very cost-effective and have the advantage of being able to double as backup systems.


Making Smaller Movies / compression strategies

FACE IT, YOU'VE GOT TO COMPRESS your movies before playing them back on the Mac or adding them to your Web site. Neither the fastest Mac nor the Internet can move uncompressed data fast enough to play video cleanly. But how much should you compress your movie, and how should you go about it? Since greater compression equals lower image quality, you need to find an optimum compression rate, based on your intended playback medium and the image quality you need. Adobe Premiere 4.2 includes features that help you optimize movies for CD-ROM data rates, but the interface is far from intuitive for novice users.

Enter MovieCleaner Pro (\$189), from Terran Interactive (800-577-3443 or 408-278-9065). This software is designed to create the best-possible video-compression settings, based on information you supply during an "interview" process. You're asked to decide the relative importance of such things as compression rate versus image quality, audio quality versus video quality, and smooth motion versus clear image quality. Also, MovieCleaner Pro compresses your movie based on what it has learned. Experienced video makers can control such parameters as adaptive noise filtering, blurring, and gamma adjustment.

To help you make your movie debut on the Web, Terran offers a plug-in for MovieCleaner Pro, called Web-Motion (\$129). Because Web access speeds vary from the painfully slow (14.4- and 28.8-kbps, with modems), compression is especially important for QuickTime movies. The data rate of your movie should be chosen to match the speed at which your audience can connect. Web-Motion also

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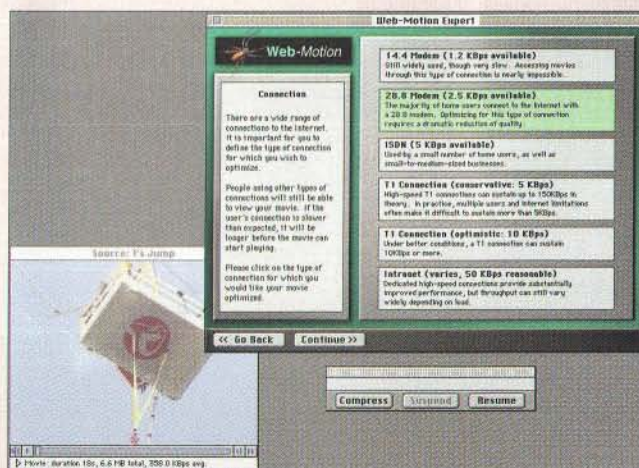
As it did in the page-layout, audio, and color-publishing realms, the Macintosh is leading the way in desktop video, providing the widest selection of components for producing movies. Although the plethora of choices can sometimes seem a bit confusing, your efforts will all be worthwhile when you finally see your video spring to life. Welcome to the bleeding edge. 

Kennedy Grey is the Online Media Director for Seattle-based Fast Forward Media Lab, a nonprofit organization that teaches at-risk youth about new-media technologies.

includes a CD-ROM with plenty of sample movies, compressed at the low data rates dictated by the Internet. These movies are integrated into the interview process to help ensure that your expectations for Web-based QuickTime movies are realistic.

Making movies that are truly Web-friendly means giving some consideration to Net-lurking PC users. Mac files typically contain two parts — a resource fork and a data fork. PC files have only a data fork. To get your QuickTime movie ready for cross-platform playback, you need to "flatten" the movie file into a single unit. MovieCleaner Pro can make your movies as flat as a pancake.

A new compressor/decompressor called ClearVideo, from Iterated Systems, holds promise for lowering the data rate while maintaining the quality of Web movies. Iterated claims that movies compressed with ClearVideo, which is based on fractal image-compression technology, can be as little as one-fifth the size of those compressed with the popular Cinepak codec, found in the vast majority of all QuickTime movies today. The decoder (player) will be distributed free of charge on the Net. / JEFFY MILSTEAD



When you use MovieCleaner Pro's Web-Motion plug-in, there's no guesswork about Web compression. If you're confused about Internet connection speeds and their effect on movie playback, Web-Motion will be able to help you.

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Pump Up Your Selection Skills

Struggling with the lasso and the magic wand? Adobe Photoshop 3.0's color channels can help.

IF YOU'VE SPENT HOURS painstakingly outlining edges with Photoshop's lasso tool, you know it's not easy to lift an object out of one image so you can place it in another. Whether you want to superimpose a porcupine on the Eiffel Tower or simply give that special someone a third arm, the trick is to understand the power of Photoshop 3.0's color channels.

The mask you can make with color-channel information is usually far more precise than what you could draw by hand, and it's *much* easier and faster to produce. Color channels contain information for each color in your image — red, green, and blue if it's an RGB image; cyan, magenta, yellow, and black if it's a CMYK image. Hidden in a single color channel, there's often more contrast between the object you want to select and its background than you can see by looking at the image as a whole. (Tip: With RGB images, you can usually find greatest contrast in the red channel and greatest detail in the green channel.) It's contrast that can help you create your mask.

Here we use a single color channel to make a mask and then paste our object into a new background. (Our images came from the Photodisc Stock library, at <http://www.photodisc.com/>.) Once you're comfortable with this technique, try creating more-sophisticated masks by combining parts of different color channels.

David Biedny is a founding editor of MacUser and the coauthor (with Bert Monroy) of Adobe Photoshop — A Visual Guide (Addison-Wesley). Nathan Moody is a multimedia artist and Biedny's Green Channel Man.



5. CORRECT THE COLOR TO GIVE A REALISTIC FLAIR.

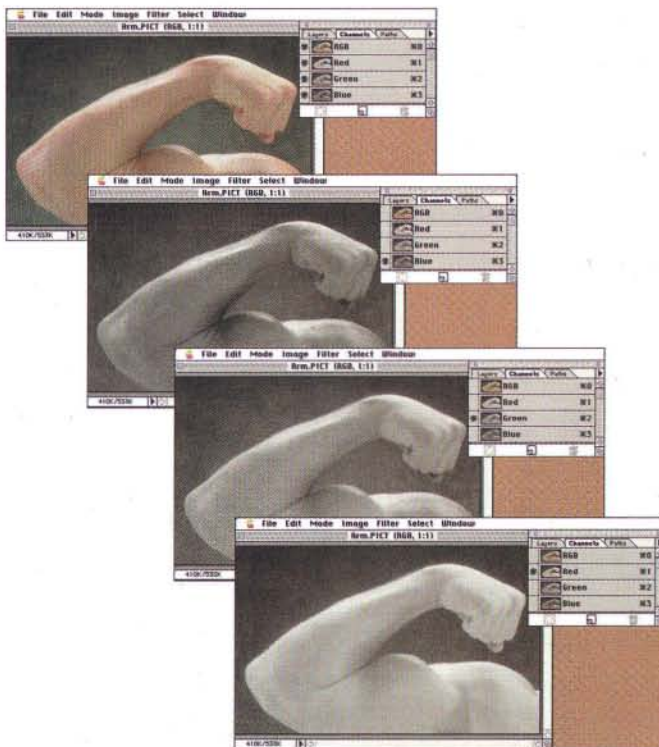
STEP BY STEP

1. CHOOSE THE COLOR CHANNEL WITH THE MOST CONTRAST. Begin by making a duplicate of your file to use for creating your mask. To make a mask, you must eliminate all of the image's midtones until you're left with a black background and a solid white space — the hole your object will show through. The more contrast you start with, the easier this process will be, so take a careful look at each channel (Window: Palettes: Show Channels). We chose to work with the Red channel, because in our image it offered the highest contrast between the arm and the backdrop.

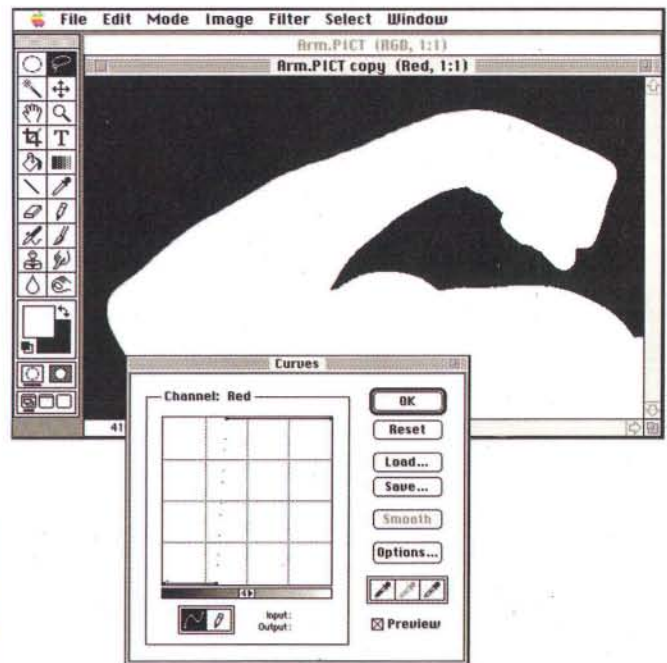
2. USE THE CHANNEL TO MAKE YOUR MASK. Activate your chosen channel by highlighting it in the Channels palette. Begin eliminating the

image's midtones by experimenting with curves (Image: Adjust: Curves). Use the more precise pencil tool at the bottom left of your Curves palette to change darker tones to black and lighter tones to solid white. Keep your eye on difficult areas — in our example, the hairs on the back of the arm and the shadow at its crook — to make sure you include them. The more carefully you make this mask, the less time you'll have to spend fixing harsh edges later. Smooth out the curve you've made by clicking on Smooth in the Curves palette. Patch small imperfections with the paintbrush tool, but if there are a lot of holes, try making the mask again from the beginning.

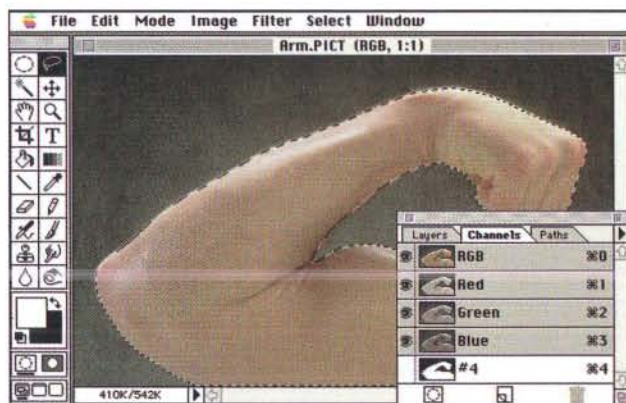
1. CHOOSE THE COLOR CHANNEL WITH THE MOST CONTRAST.



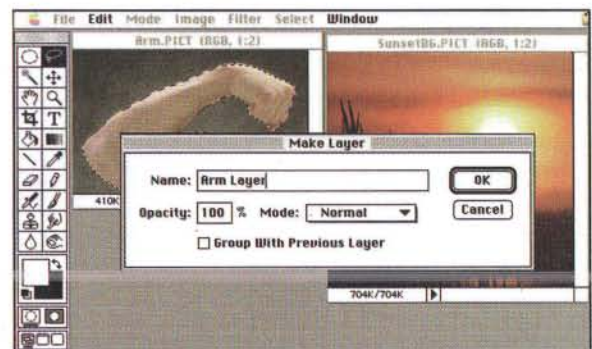
2. USE THE CHANNEL TO MAKE YOUR MASK.



3. USE THE MASK TO SELECT YOUR OBJECT AND PLUCK IT FROM ITS ORIGINAL BACKGROUND.



4. BRING BACKGROUND AND FOREGROUND TOGETHER TO CREATE YOUR NEW IMAGE.



3. USE THE MASK TO SELECT YOUR OBJECT AND PLUCK IT FROM ITS ORIGINAL BACKGROUND. Duplicate this channel — your new mask — and paste it into your original file. To do this, you can drag and drop the channel onto your original image or choose Duplicate Channel from the pop-up menu on the right of the Palettes menu. Now you can use your mask to select the object. Load the channel as a selection (Select: Load Selection), and then revel in the sight of your object selected and ready, all without use of the lasso or the magic wand.

4. BRING BACKGROUND AND FOREGROUND TOGETHER TO CREATE YOUR NEW IMAGE. Paste the selected object into your new background as a

new layer (Edit: Paste Layer). Creating a new layer is your best bet when you bring together elements from various images, because you can move, resize, and color-correct the elements without affecting the background. Your object might have some harsh edges despite your efforts. If so, try defringing them one or two pixels (Select: Matting: Defringe).

5. CORRECT THE COLOR TO GIVE A REALISTIC FLAIR. To make your new image look more natural, match the color tone of your foreground and background elements. Using the Color Balance command (Image: Adjust: Color Balance), we shifted our arm's hues away from greens and blues to accentuate the warm reds of sunset.

Print Nuts Posting on an Open Wire

May your daze be merry and bright, and may all your halftone dots be right.

THE END OF THE YEAR, AGAIN. Last year at this time, we drew up a holiday wish list for the coming year. Let's check last year's list to see if we got what we asked for:

A font-management system that works. *Not quite there yet.* Among other things, we asked for a font-management system smart enough to find and install missing fonts automatically. Symantec finally came out with an update to the popular Suitcase font utility, but it's still basically a passive system that requires you to keep track of font requirements manually. The most promising development is Font Reserve, an intelligent font-substitution database from DiamondSoft.

Simple systems. *Not there yet, and possibly getting worse.* We asked for an operating system that doesn't require a lot of third-party stuff to give it basic functionality. Not only don't we have Mac OS 8 (née Copland) but we're also going to get it only in dribs and drabs as new code and bug fixes warrant updates. Plus, things get more complicated as we head for a more document-centric environment. Web pages are already delivering Java code, and there will inevitably have to be some mediation between what an operating system supplies and what you download from the Internet. Stay tuned.

Better testing. *Perhaps pie in the sky.* We hoped that vendors would, in effect, talk to each other more. The idea of testing for interoperability shouldn't be foreign. Realistically, though, this has as much chance as the proverbial snowball in Hades.

Database management. *Moving in the right direction.* We wished for a more intelligent database structure so that data could drive the production process actively. Several encouraging products that extend the concept of data management to asset management have since appeared, including ones from

Archetype, Canto, and Scitex.

Anything other than HTML. *Improved, sort of.* Hoping for something that didn't look like warmed-over typesetting, we asked for a Web



authoring language with visual richness. Adobe Acrobat has made inroads on the Net because it delivers visual richness. With the Acrobat plug-in for the Netscape browser, you can view and download individual Acrobat pages without retrieving an entire document. **Reasonable RAM prices.** *Halfway there.* Supply finally caught up with demand, and it's been a great time to buy RAM. If only the logic-board engineers kept the same SIMM/DIMM design for a few product cycles...

What Next?

What's on this year's holiday wish list?

Apple shapes up. The company must understand that publishing is its key market. Apple has always been and will continue to be challenged by the PC community. We may not need a Mac to run Excel, but we sure do need one to effect color management. We also hope that Apple will start producing an entire Mac line that not only looks and feels but also is reliable. The PowerBook 5300 problems this year hurt the credibility of the rest of Apple's computers enormously.

Windows NT runs on an Apple box. Although we hear only distant rumors of this, we'd like to be able to run Windows NT server software on a Mac. The benefit? Real connectivity with the "other" community while having the ability to use the Mac for those tasks in which it beats a PC hands down.

Supra emerges. Adobe's new PostScript architecture helps make output (of any sort) more reliable and predictable, and we'd like to see it sooner rather than later. We hope Adobe will remember that it needs to stay intimately tied to high-end commercial publishing.

DVDs materialize. Wouldn't it be nice not to have to wait two years for an affordable Digital Video Disc machine? We might then get on with the evolutionary changes of this recordable medium a lot faster. Intuit's pricing model for Quicken offers a big lesson here — low-entry cost leads to wide adoption.

Software synchronizes. We wish all software vendors would issue one big megarelease on a given day and then keep quiet for a year, so we could get some work done instead of spending our lives upgrading. We could call it Software Appreciation Day... Hallmark could issue a line of greeting cards... maybe there could be a parade down Fifth Avenue.

No more Web crawling. Whatever it takes to speed up data transfer on the Internet would round out our list. It's bad enough that many Web pages really do rate recognition on Mirsky's Worst of the Web site. It's worse that we have to wait as long as we do to view this ugly stuff. ISDN helps with this only somewhat, and it is still too expensive in many areas of the country. We want bandwidth!

Well, that's it for this year. Not too much to ask, is it? What would you ask for? Let us know at experttips@macuser.com. More important, we hope you have a healthy and happy holiday season. May the god of installations smile on your technological innovation. ☐

Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a graphic-arts consultant and a partner in Genex Media, a company specializing in new media and Web design.

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\$49⁹⁵

8MB (80ns)

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\$89⁹⁵
each.

16MB (80ns)

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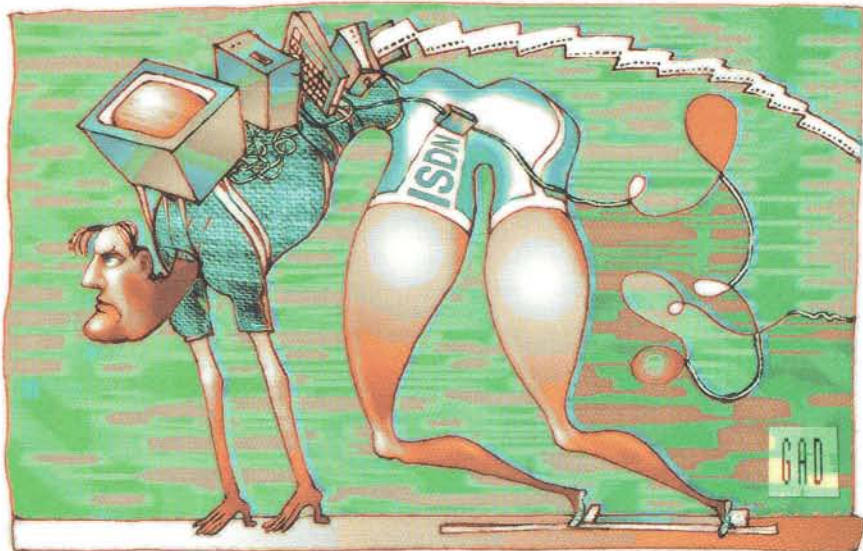
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NETWORKING

Want to blast through the Internet at warp speed? ISDN can be your ticket to a cyberspace thrill ride.



By Gregory Wasson

ISDN On-Ramp

FOR THOSE WHO ARE SPOILED by a speedy, direct connection to the Internet at work and long for something better than the barely tolerable 14.4- or 28-kbps modem connection they have at home, ISDN (Integrated Services Digital Network) provides a viable alternative. And the good news is that prices are down and availability up.

ISDN — the digital phone system — is addictively fast (four to ten times as fast as analog lines), but getting wired into the technology can be frustrating, especially for inexperienced home users, who must contend with a blizzard of new jargon and an unfamiliar set of choices. This step-by-step guide will take some of the pain out of setting up a home-based ISDN connection.

Step 1: Call the Phone Company

Before you take the ISDN plunge, you'll need to go on a fact-finding mission. Find out if your phone company provides residential ISDN service in your neighborhood. All of the country's "Baby Bells" offer ISDN to some portion of their service area, and some companies (such as Pacific Bell on the West Coast) are very aggressive in spreading the ISDN gospel. Even in heavily wired areas, there are

communities not yet served by ISDN.

If you have a choice between Residential or Business ISDN, chances are that the former will be much less expensive. Ask a lot of questions about the exact costs of the ISDN package that interests you. Is there a setup charge? Many phone companies offer steep discounts on the installation fee if you agree to keep the service for a specified period of time — say, two years. Remember, though, that you're likely to face painful penalty fees if you break that agreement. Usage fees are another hidden ISDN cost. Unlike with standard (analog) phone service, ISDN calls will often cost you during business hours. You may pay \$.02 or \$.03 cents a minute. Night and weekend calls are often free. The "Baby Bells Go Digital" table shows a sample of residential ISDN rates from each regional phone company.

With the price established, move on to nuts and bolts. You'll need to know what type of digital switch (AT&T's 5ESS and Northern Telecom's DMS-100 are the most common) your phone company employs. If you have a choice between 5ESS and some other switch type, choose the more flexible 5ESS.

Finally, ask about discounts or specials on ISDN equipment or Internet accounts. You can

sometimes find deals that combine a pre-configured ISDN modem with an account at an ISP (Internet service provider).

Step 2: Shop Around for an ISP

Learning about and finding Internet access also requires a fact-finding expedition — the most important one of the process. Finding an ISP you feel comfortable with is essential in making your transition to ISDN as smooth as possible. If your current ISP offers ISDN, you may be able to switch account types at little cost. If your current provider is an on-line service (AOL or CompuServe) or does not offer ISDN access, it's time to do some digging.

ISPs come in two flavors: local and national. Local ISPs often offer lower costs, experience in working with your phone company, and plenty of storage space for your FTP and Web pages. On the other hand, local ISPs are often staffed by twentysomething computer-science grads who can be condescending to anyone who doesn't speak geek. National ISPs, such as Netcom and UUNet, generally offer better documentation, fewer busy signals, a bundle of useful software, and more hand-holding for Net newbies.

The best way to get the lowdown on an ISP

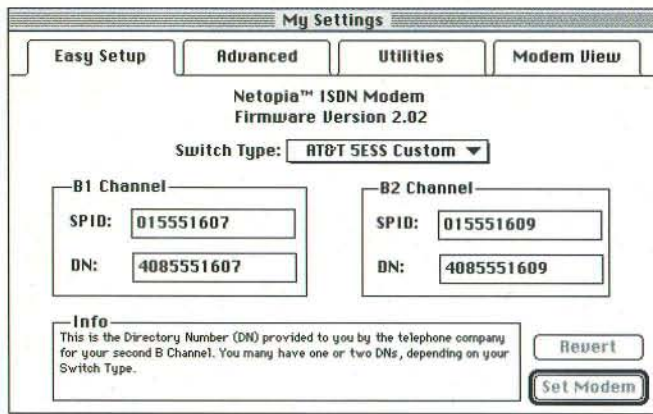


figure 1 / The Netopia ISDN Modem's configuration utility displays a simple tabbed dialog box where you enter SPIDs, DNs, and other information about your ISDN line.

is by word of mouth. Ask your friends and coworkers about their ISPs. How reliable are the providers? Do busy signals often block access? Is technical support readily available? Above all, ask about support for Mac users and for ISDN connections.

The List (<http://thelist.iworld.com/>) is a great online source of ISP information. This superb Web site allows you to search for national as well as local ISPs by area code, by state, or by pointing at a map. Each listing contains the latest rate information, options (such as ISDN support), special deals, and contact information. You'll find more ISDN-friendly ISPs in the "Nation of Surfers" table.

When you're interviewing ISPs, ask about compatible ISDN equipment. Some ISPs offer technical support only if you buy specific ISDN modems. Some ISPs even sell the equipment preconfigured. This can take a lot of the sting out of setting up ISDN at home, but you may pay a little more for equipment than you would by shopping from a catalog or at a computer superstore.

Compare prices and options. Some ISPs charge a flat monthly rate, with unlimited Net access. Others give you a set number of hours each month and charge a per-minute rate for usage beyond that limit. Find out whether access charges are higher for ISDN connections than for analog ones. Many companies have dropped two-tier pricing; others still charge ISDN customers more. You should expect to pay a \$20-to-\$30 account-setup fee. Monthly costs vary quite a bit, from \$7 to \$50, depending on the number of free hours included.

If phone company and ISP representatives have answered all of your questions, it's time to start buying and ordering things. If not, you might want to take a quick look at some of

questions.html. Pac Bell's ISDN Help Desk (http://www.pacbell.com/products/business/fastrak/networking/isdn/info/Help_Desk/isdnfaq.html) is also an excellent place to go for ISDN info, whether you live on the West Coast or not.

Step 3: Purchase Hardware

ISDN connections require two hardware components: a terminal adapter (TA) and a network terminator (NT-1). Today, most consumer ISDN devices (external boxes, often called ISDN modems) include a TA and an

the excellent ISDN resources that are on the Web. Dan Kegel's ISDN Page (<http://www.ocn.com/dank/index.html>) is a comprehensive resource. It tends to be fairly technical, however, and may not suit users just getting started with ISDN. Get your feet wet with Netcom's good entry-level ISDN pages, at <http://www.netcom.com/isdn/>

NT-1. The Motorola BitSurfr Pro and the Farallon Netopia ISDN Modem are both popular choices for Mac users. The Farallon package gets the nod for its easy installation and configuration software. Whatever ISDN device you choose, be sure there's at least one analog port for your fax machine, voice phone, or analog modem. You can make and receive standard phone calls with your ISDN line, so long as an analog device is connected. Some ISDN devices (including the U.S. Robotics Courier-I Modem) include an analog modem. Don't be tempted to replace your current phone line with ISDN. Although you can use the ISDN line to make voice or modem calls, it's a good idea to keep your existing phone line: ISDN will go dead in the event of a power failure; analog phone lines will not. You'll pay between \$350 and \$450 for an ISDN modem with an analog port.

Last, make sure your ISDN modem supports Multilink PPP (MPPP). This capability lets you combine — or *bond* — the two 64-kbps channels that make up your ISDN connection, thereby doubling your access speed.

Step 4: Order Your ISDN Line

Call the phone company to order your line. You want an ISDN BRI (basic-rate interface) — commonly called a 2B+D configuration. A BRI

A Nation of Surfers / ISDN-ready ISPs

ISP	Account-Setup Fee	Monthly Rate(s)	Web Space
GTE Internet Solutions 800-927-3000 http://www.gte.net/	\$40	\$40 – \$65	1 MB
InfiNet 800-849-7214 http://www.infi.net/	none	\$20 – \$25	3 MB (\$5)
MindSpring Enterprises¹ 800-719-4332 http://www.mindspring.com/	\$35	\$7 – \$27	5 – 10 MB
Netcom 800-353-6600 408-983-5950 http://www.netcom.com/	\$50	\$30 (+ \$3/hour)	1 MB
UUNet Technologies 800-488-6383 703-206-5600 http://www.uunet.com/	none	\$30 (+ \$2/hour)	none
USA.NET 800-592-1241 http://www.usa.net/	\$20	\$6 – \$33	1 – 3 MB
Whole Earth Networks 800-246-6587 415-281-6500 http://www.well.net/	none	\$10 – \$25	25 MB

¹Combines PSINet's Pipeline and InterRamp services.



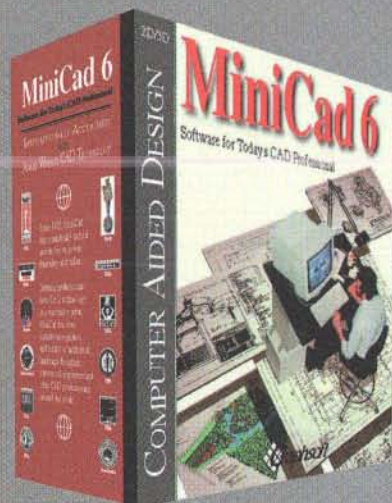
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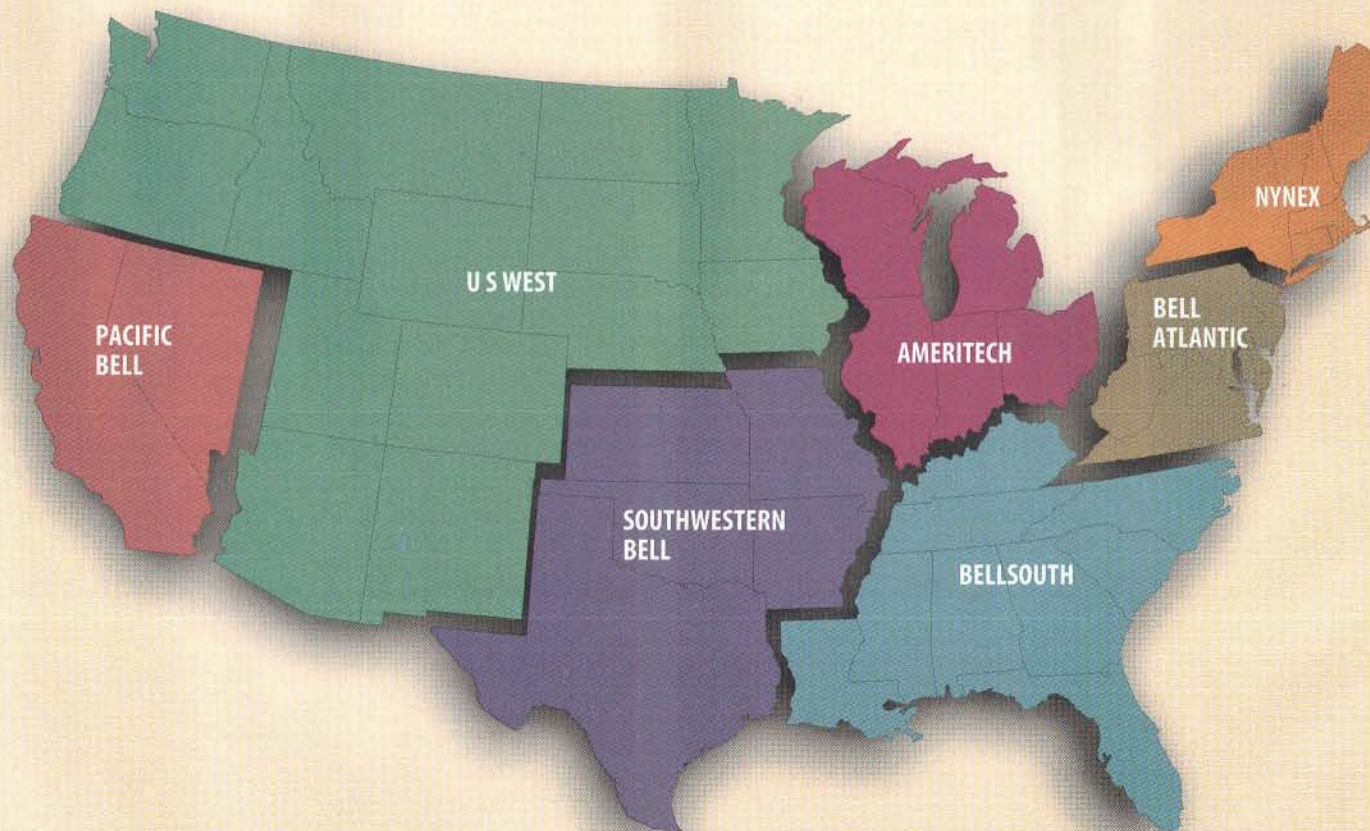
Baby Bells Go Digital / your ISDN connection

YOUR TELEPHONE COMPANY probably offers ISDN service. Setup fees and monthly rates vary widely, and the service is not available to every telephone customer. The map below shows the division of territory among the so-called Baby Bells. The table lists contact information and prices for ISDN service around the country.

Whereas Baby Bells serve specific geographical regions, GTE (800-483-4926; <http://www.gte.com>) has telephone customers scattered throughout 28 states. It offers ISDN service in 18 states, and fees vary from state to state. Costs range from \$80 to \$155 for residential installation and from \$30 to \$50 per month plus \$.03 per minute for access time. The company says that it plans to eliminate per-minute charges in the near future.

Phone Company	Setup/Installation Fee	Monthly Rate	Per-Minute Rate
Ameritech 800-419-5400 http://www.ameritech.com/	\$113 – \$135	\$28 – \$31	\$.02
Bell Atlantic 800-570-4736 http://www.bell-atl.com/	\$125 – \$173	\$27 – \$34	\$.01 – \$.02
BellSouth 800-858-9413 http://www.bell.bellsouth.com/	\$25 – \$275	\$33 – \$86	none
NYNEX New England 800-438-4736 http://www.nynex.com/	\$67 – \$350	\$24 – \$90	\$.05 – \$.24
NYNEX New York 800-438-4736 http://www.nynex.com/	\$67 – \$350	\$24 – \$90	none
Pacific Bell 800-316-3700 http://www.pacbell.com/	\$35 – \$125	\$25	\$.00 – \$.03*
Southwestern Bell 800-792-4736 http://www.sbc.com/	\$200 – \$400	\$51 – \$104	\$.10 – \$.25
U S West 800-246-5226 (IA, SD, ND, MN) 800-222-2121 (WA, OR, ID) 800-289-9091 (CO, WY, NE, MT) http://www.uswest.com/	\$65 – \$210	\$39 – \$199	\$.02 – \$.07

*Pacific Bell does not charge for ISDN calls during evening and weekend hours.



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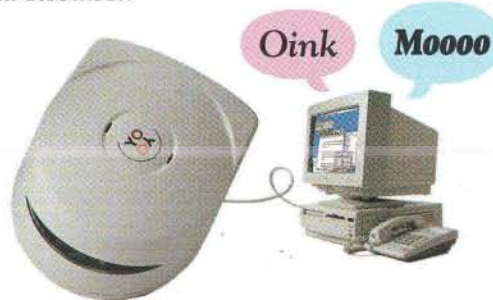
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gives you two 64-kbps data channels (and one D channel, which manages communication between your line and your ISP).

It's worth noting that Pacific Bell's ISDN customers don't get a full 64 kbps per channel. The ISDN switching equipment used by Pac Bell limits maximum throughput to 56 kbps per channel.

If the phone company is able to give you your ISDN telephone numbers (called DN numbers) and SPIDs (Service Profile IDs,

based on the DN numbers) before installation, jot them down. Some systems don't require SPIDs, or they need only a single one. Whatever the case may be, you will require this information in order to configure your ISDN modem.

Now sit back and wait. The delay between ordering a home ISDN line and its actual installation is growing, along with the demand for connections. In some areas, you may have to wait several weeks.

Step 5: Set Up Your Internet Account

Call or visit your chosen ISP, to establish your account. You'll want an ISDN PPP configuration. It usually takes 24 hours or so for the ISP to activate your account. Just make sure it's ready before the phone company shows up to install your ISDN line, so you'll be able to test your connection while the installer is at your home. Make sure the ISP gives you a data sheet listing all the settings you'll need in order to configure MacTCP (TCP/IP under Open Transport) and your Internet-access software.

Step 6: Connect and Configure

Connect the ISDN modem to your computer (see the product documentation), and configure the applicable software with the settings provided by your ISP and phone company. Try to do this the day before the phone installer arrives. Most ISDN-connection problems involve SPIDs. Don't assume that the phone company has provided them in the form your modem and software require. For example, the phone company may give you a SPID in the form 0555-16070, when it should be entered as 01555-16070. If you've chosen a savvy ISP, the tech-support staff may help you with such idiosyncrasies. You should also carefully grill the phone-company installer on this issue.

Don't let the installer get away! Once the line has been installed and activated, try to make the first connection with your Internet account, using the PPP software that came with your ISDN modem or a package provided by your ISP. It's also a good idea to try a call with your phone or modem attached to the ISDN device's analog port (if it has one). If you have trouble getting connected, the installer might be able to do some troubleshooting. If not, check with your ISP's tech-support department *before* you contact the company that makes your ISDN modem. The ISP, especially if it's a local company, is usually a better bet for fast, accurate configuration support.

Ready for Blastoff

It's not as easy as setting up an account with an online service such as AOL or CompuServe, but getting and using an ISDN-based Internet connection is becoming easier — with better configuration software and cooperation among phone companies, ISPs, and hardware makers. It's cyberspeed for the rest of us. ■

Gregory Wasson is a MacUser contributing editor. His online activity (starting at 1,200 bps) has included stints as a sysop on ZiffNet/Mac and as Webmaster for NetCarta.

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Protecting Kids and Free Speech

Can we shield kids from inappropriate material on the Net without giving up free speech?

WHETHER YOU'RE A PARENT concerned about your child's safety out there on the cyberfrontier or an unchilded Netizen who doesn't want to see the Net dumbed down to the level of the average eight-year-old or United States senator, you have a stake in how kids surf the Net. There really is material there that's inappropriate for children by almost anyone's standards, and there are other risks to consider, such as the possibility that a child will share some private family information in online chat rooms. So how can parents make sure their kids surf the Net wisely?

Night Baseball. One approach is to give kids plenty of good places to go. And there are plenty: Kids can connect with their peers online, explore history and science, play games, and research homework projects, if they only know where to go. One of the best where-to-go places for 8- to 14-year-olds is Yahoo's Yahoooligans! site at <http://www.yahoooligans.com/>. It's organized like the main Yahoo site but has a kid-friendly tone and site list. The Ultimate Children's Internet Sites list (<http://www.vividus.com/ucis.html>) is a good place for parents to search for the best Net starting points: It's organized by age group.

But none of these good places can guarantee that your kids won't find the bad places. That's what Bess, a kid-oriented Internet service provider — which filters out most newsgroups and chat areas and checks incoming and outgoing e-mail for naughty words — attempts to do. Connecting with Bess can be complicated and somewhat expensive, but it starts with a phone call to 206-971-1400. You can check out Bess with the CD-ROM included in Julie McKeehan's *Safe Surfing* (AP Professional, 1996), a guide to the Net for parents, covering everything from getting connected to recommended sites. And *The Internet Kids*

Yellow Pages, by Jean Amour Polly (Osborne/McGraw-Hill, 1996), contains a huge list of kid-oriented sites.

Get With the Program. You can do what Bess does, by installing software that filters out objectionable material and sites. Your choice

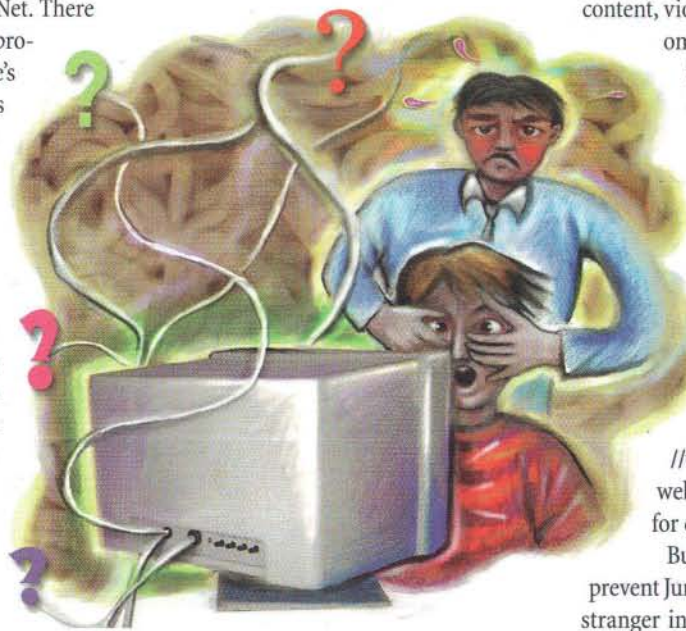
can guarantee that kids won't come across inappropriate material on the Net, if only because there is no universal agreement about what is appropriate. There are, however, efforts afoot now to provide parents with information about the contents of Net sites — sexual content, violent content, naughty words, recommended ages, and so on — in a form that Web browsers and other software will be able recognize and respond to. Interested groups can rate sites in various ways, more different ways than movies are rated, and parents can instruct their software to filter out or select sites based on their ratings. This effort, which you can read about at the Platform for Internet Content Selection (PICS) site at <http://www.w3.org/pub/WWW/PICS/>, is well under way and should be a boon for concerned parents.

But PICS is no silver bullet. It won't prevent Junior from telling some anonymous stranger in a chat room where you live and when you'll be away on vacation. Only a set of family rules for Internet use can do that. Fortunately, you don't have to dream them up yourself. Author Larry Magid has been waging a one-man crusade to educate parents about the Net and has a set of rules for safe surfing at <http://www.larrysworld.com/>. Kids should take his advice to heart, as should their parents.

And keep some perspective. The risks have been highly exaggerated. The most important safety tip for Net surfers is, always sit at least an adult arm's length from the monitor.

Don't Know PICS from PICT?

MacUser maintains a list of FAQs about the Internet, MacUser itself, and this column specifically. Send mail to faq@macuser.com. MacUser's address on the World Wide Web is <http://www.macuser.com/>. You can reach me at traveler@macuser.com.



today is between SurfWatch and Cyber Patrol. Cyber Patrol blocks more kinds of things and is more customizable, but SurfWatch is more robust, more professional-looking, and easier to set up and use. They're each under \$50 list, but you have to subscribe to a service that maintains a list of blocked sites, at \$40 to \$60 per year. If your Internet provider is CompuServe or Prodigy, you get Cyber Patrol for free. You can see demos of SurfWatch and Cyber Patrol at <http://www.surfwatch.com/> and <http://www.microsys.com/>, respectively.

Like grammar-checking software, these tools try to do something that really requires human judgment. Predictably, they don't always succeed. Like childproof caps, they aren't guaranteed childproof but they'll probably frustrate adults.

Rules and Ratings. You should understand that nothing — no list of good sites, no blocking software, and no government legislation —

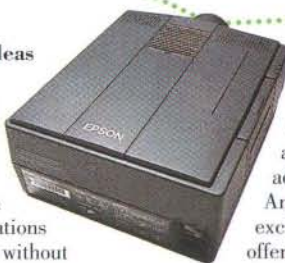
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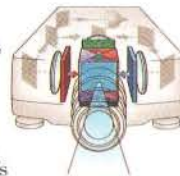
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By Kristina De Nike

Easy Hard-Drive Maintenance

WHAT'S TRULY VALUABLE becomes obvious when your hard drive fails. It's not that hunk of lifeless plastic and metal that cost you a few hundred bucks. No, what will actually make you shed tears is the loss of hours of work because your data is gone. Rather than have to face such a grim reality, let us help you take measures to hold onto the most irreplaceable part of your drive — the data.

Run a Full Format

Don't just initialize a brand-new disk — run a full format (check your formatter's manual for instructions). During this process, the formatting software checks every block on the disk and then entirely avoids blocks that have problems, by writing around them. It's well worth the few extra minutes that formatting requires.

Nix the Write Cache?

Apple finally took advantage of the speed gain, which third-party drive makers have taken advantage of for some time, when it turned the write cache on by default for the first time in its PCI-based Macs. Does that mean that you should leave the write cache on? In most

cases, yes. Usually you can only benefit — the write cache speeds up data transfers by storing data quickly in a temporary space until there's time to write data permanently to disk. The potential problem with using the write cache, however, is that any data in this cache is unrecoverable if the internal drive loses power — during a crash or a shutdown, for instance. Losing data in the write cache isn't usually a threat with external drives, since they have their own power supplies, but with internal drives, it's a real possibility.

If you're worried about losing the small amounts of data in the write cache of an internal drive, you'll need a third-party formatting utility to turn the cache off. Apple's utility doesn't give you such control. Such utilities as Anubis Pro, from CharisMac (800-487-4420 or 916-885-4420); Hard Disk ToolKit, from FWB (415-325-4392); or DiskWorks, from MicroNet Technology (800-800-3475 or 714-453-6100), will do the trick. You can find the setting you require by accessing SCSI Mode Page 8 (see figure 1) from any of these utilities.

SCSI Mode Page 8 is also where you'll find the read-cache setting, an option you should turn on, since it poses no threat and it speeds

up your drive. Resist the temptation to experiment with other Mode Page settings — a wrong choice could make your disk invisible.

Use Write Verification

Perhaps an extreme measure, but a good one all the same, for protecting data that some formatting software allows is to turn on write verification, which prevents errors by comparing data written to disk with the original data. Since write verification significantly increases the time it takes to write data to your disk, you should use this protection only if you're unusually worried about losing data — if you suspect your drive is about to fail, for instance.

Perform Regular Checkups

Turning off the write cache and turning on write verification will help you avoid losing small bits of data, but you still run the risk of losing the whole shebang in the event of hard-drive failure. One of the best ways to prevent such a disaster is to stay in close touch with the state of your hard disk; run disk checks regularly — say, weekly. Disk utilities such as MacTools Pro, from Central Point (800-441-7234 or 503-690-8088), and Norton Utilities, from Symantec (800-441-7234 or 310-453-

4600), will show the number and type of errors your disk has. Keep an eye out for problems specifically with the driver, partition map, master directory, volume information, and B-tree. These errors may be serious and need to be fixed immediately with a disk-repair utility such as Apple's Disk First Aid, Norton Utilities, or MacTools. Multiple errors of these types require more than just a repair utility, since they may indicate that the drive is about to fail. In that case, run disk checks frequently, back up often, and replace the drive as soon as you can afford to. When running a disk check, go ahead and optimize too. It will improve the drive's speed, make files easier to recover, and make directories less vulnerable to corruption.

Monitoring your hard disk can help you avoid big data loss, but you can also use disk checks to automatically fix small problems. To do this, run a check in the background with a utility such as Norton Utilities or MacTools Pro. These tools also allow you to recover files you've recently thrown away and, in the case of MacTools Pro, perform valuable virus checks.

Another checkpoint method that can forewarn you of disaster is running HDT Diagnostics, which is part of Hard Disk ToolKit. During startup, HDT Diagnostics looks for an increase in bad disk blocks. This test is not exhaustive — for instance, it won't tell you if there are problems with the directory — but it can signal serious mechanical problems. If it shows a large jump in the number of bad blocks, your drive may be about to fail. Again, back up frequently and replace the drive as soon as possible.

Beware of Disk Compressors

A utility that doubles your disk capacity may sound like a pretty good idea, but it's probably not worth the risk. Since such utilities compress every file on your disk, it may be

impossible to recover them if the drive fails. In some cases the disk-doubling utilities themselves may introduce errors that will ruin your disk.

Use Removables

We certainly don't want to be the cause of undue paranoia, but there are cases of angry coworkers being a threat to data. If you suspect that shady characters have revenge on their minds, do more than password-protect your Macintosh. Keep intruders from reformatting the entire disk and destroying all your files by using a removable drive, which you can lock up.

Bring Back the Dead

What do you do that fateful morning when you flip on the hard-drive switch and nothing happens? All is not lost. It probably just means that the power supply is dead, and all you need to do is replace the case. If the drive isn't under warranty, you can buy a new case with a working power supply. Companies such as APS Technologies (800-235-2753 or 816-483-6100; <http://www.apstech.com/>) sell empty enclosures, complete with directions for installing your old mechanism in the new case. (For tips on avoiding hardware problems, see the "Hardware Care" sidebar.)

If the problem is not that your drive won't turn on but simply that the disk is missing some files, try a file-recovery program such as Norton Utilities or MacTools Pro. Be sure

Caching Parameters

Select the parameters to customize:

- ☐ Write Cache Enable (WCE)
- ☐ Multiplication Factor (MF)
- ☐ Read Cache Disable (RCD)

Demand Read Retention Priority: 0

Write Retention Priority: 0

Disable Prefetch Transfer Len: 0

Minimum Prefetch: 0

Maximum Prefetch: 0

Maximum Prefetch Ceiling: 0

Default

Cancel

Save

figure 1 / You won't run the risk of losing the data stored in your drive's write cache (temporary storage space) if you turn that cache off. You can find the setting on SCSI Mode Page 8 of some disk utilities, such as Hard Disk ToolKit. Leave the read cache on, since it speeds up the drive without the threat of losing data.

to use another disk as the destination volume during the recovery — that way you won't change anything on the failed disk and can also avoid further damage to files. Besides, it's not wise to trust the failed drive for this important task. Next, copy all the files from the ailing drive and reformat the disk. Maybe it was a random corruption and the drive is actually fine. It may last you another few years — or at least until you can afford to buy a new one.

If you hear the drive mechanism making terrible noises — whining or grating — stop whatever you're doing and turn off the drive. Your only hope is a recovery service. You could send it to the drive's manufacturer, but manufacturers guarantee the drive only, not the data. To get your data off the failed disk, turn to a service such as Ontrack Data Recovery (800-872-2599 or 612-937-5161; <http://www.ontrack.com/>) or DriveSavers (800-440-1904 or 415-883-4232).

Why Wait?

All hard drives fail eventually, so right now is the time to protect your valuable data. Using our methods may help you avoid losing hours of work. ☐

MacUser Labs Senior Project Leader Kristina De Nike always makes sure that her drives have plenty of breathing room.

Hardware Care / how to make your hard drive last

ONE IMPORTANT WAY to protect your data is to protect the hardware that contains it. Here are some simple ways to treat your hard drive right:

- Keep your drive on a flat surface with open space around it. The fan in the case will lengthen the life of your drive by keeping it cool, but only if it can pull in and expel air.
- Keep the drive away from dust and smoke, which can damage the power supply.
- Keep the drive and its cable away from magnets, since your disk is susceptible to damage from strong magnetic fields. For instance, don't put your drive

directly on top of your monitor; older monitors especially emit electromagnetic radiation.

- Never move your drive while it's on. Like the arm on an old-fashioned turntable, a drive head moves across a platter when you're using the drive. Jarring the drive at those times can destroy the disk. Also, keep your PowerBook as stable as possible when it's on, to avoid head crashes.
- Protect your drive's power supply by plugging the drive into a surge protector.
- If you need to ship a drive, use the box it originally came in.

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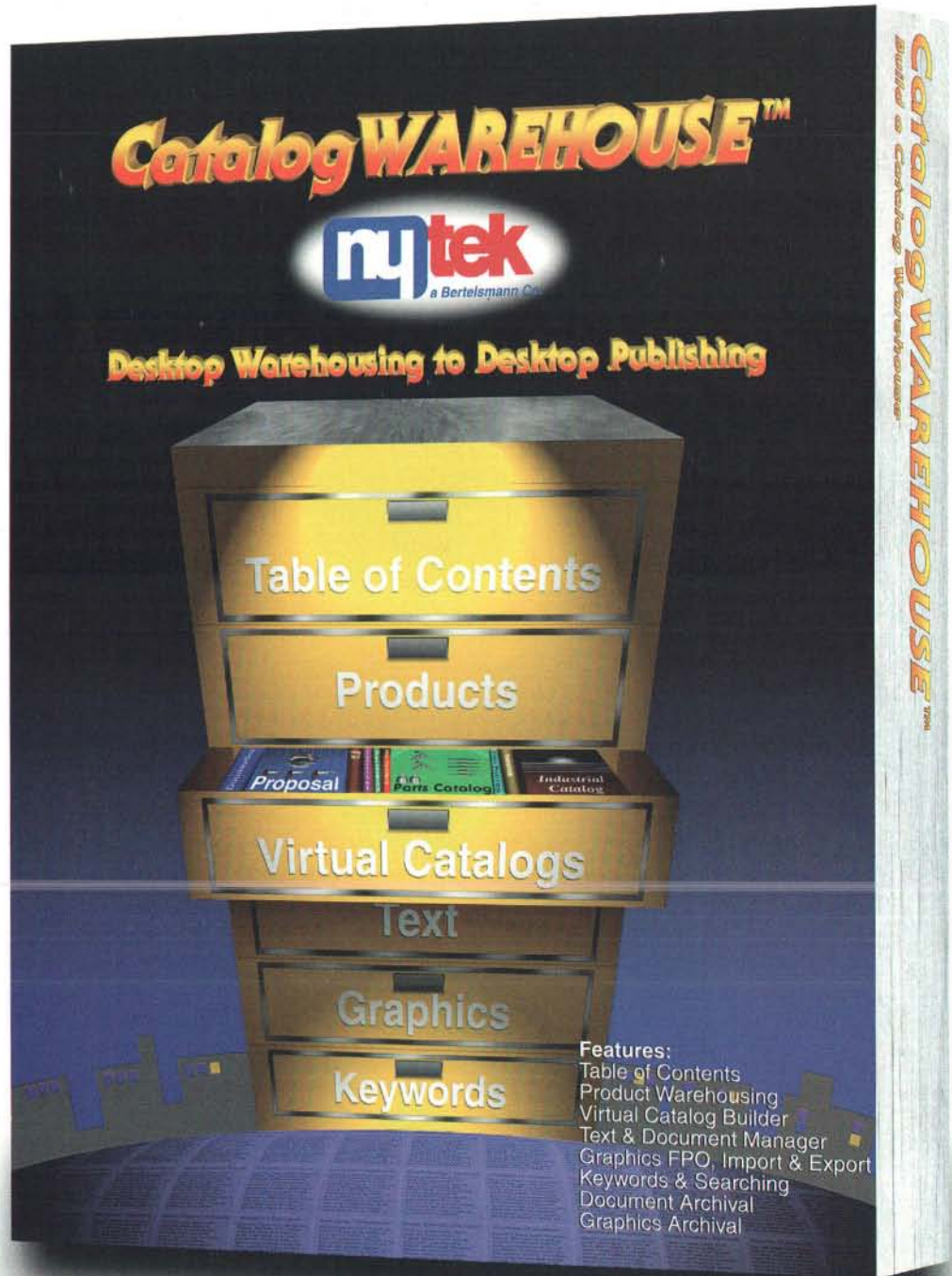
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**See You
Online!**

By Bob LeVitus and Christopher Breen

Help Folder

Where the gray went, curing Mac amnesia, and networking for game players.

But I Want to Go Gray

Q. I have an AppleVision 1710AV monitor and a Power Mac 7200/90 with 2 MB of VRAM. Why can't I set my monitor to display fewer than 256 grays? There are no 16-color, 16-gray, or black-and-white options in the Monitors control panel. I'm running System 7.5.3.

Beniamino T. Cenci-Goga
Perugi, Italy

BOB: That's easy. And it has nothing to do with your monitor. Unlike older Macs, most Power Macs don't support monitor settings of 2, 4, or 16 colors or grays.

CHRIS: That's kind of a drag if you're trying to play a crusty yet beloved game. And what's even worse, very few third-party video cards for Power Macs support those color settings.

BOB: So most Power Mac owners are out of luck. There is one ray of hope for those of you with a 6100, 7100, or 8100 (sorry, Ben) with built-in video. These are the only Power Macs we know of capable of supporting 2, 4, or 16 colors. Just make sure you connect your monitor to the high-density monitor port, the strange nonstandard square-shaped one on the back of your Mac.

CHRIS: Of course, you'll need a special HDI-45 cable (or cable adapter), but that's a small price to pay for progress, isn't it?

Dealing with Memory Loss

Q. Sometimes when I open the About This Macintosh window on my Power Mac 7500 (running System 7.5.3) and add up the



amounts of memory used by the system software and open applications, I come up short of the RAM I know is installed. What's wrong?

Chris Ryan
via the Internet

CHRIS: The condition you describe is similar to one experienced by yours truly at his last high-school reunion. Like me — staring dumbly in nonrecognition at that six-foot-four-inch bald guy who, as it turned out, used to come up to my third vertebra at Menlo-Atherton High all those years ago — your Mac is suffering from “memory leak.”

BOB: Unfortunately, many users of PCI Macs will become all too familiar with this term. Leaks happen when your Mac doesn't appear to release an application's RAM when you quit that application. You've seen the results of this condition in the memory-usage statistics in the About This Macintosh window. Those annoying Not Enough Memory messages that pop up even when you know that you have plenty of spare RAM are another symptom of memory leak.

CHRIS: Unlike my reunion malady — where a simple glance at baldy's name tag brought best-left-repressed memories flooding back — reclaiming the Mac's memory isn't so easy.

BOB: Although you can haul back a few kilobytes of RAM with E. Kenji Takeuchi's free-ware utility Mac OS Purge or MacUser's own RAM Handler, the only sure way to restore your RAM is by restarting your Mac.

CHRIS: Although it won't completely solve your problem, you can apply an ounce of prevention. If you're using Open Transport as your networking software, open the TCP/IP control

panel, click on the Options button, and uncheck the “Load only when needed” box (see figure 1). When the box is checked, Open Transport TCP/IP takes its place in memory between other open applications. When you quit those applications, TCP/IP is still there, smack-dab in the middle of your RAM. This results in fragmented memory

or, as our German friends might say, *der Leak*.

BOB: Another culprit is the operating system itself. System 7.5.3 clears up several 7.5.2 glitches, but memory leaks are much more common with the new software. Unfortunately, we'll see the end of the leaks only when Apple fixes the problem in a future OS update.

Meanwhile, I've made it a habit to restart a couple of times a day, whether I need to or not, and this seems to have made my PowerWave more stable.

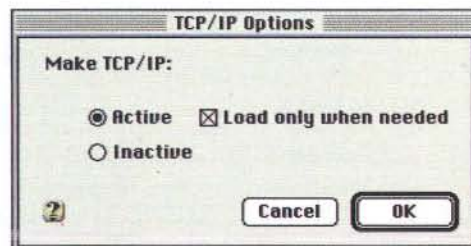


figure 1 / Uncheck this box inside the TCP/IP control panel to seal a major memory leak.

Out of Adjustment

Q. I'm trying to allocate additional memory to Adobe PageMill 1.02, and for some reason, I can't type in the Preferred Size field of the Get Info box. How can I accomplish this?

Joe Pike
via the Internet

BOB: We can think of three things that might cause what you describe. First, PageMill is open while you're trying to adjust its memory allocation. You can't change a program's Preferred Size while the program is open.

CHRIS: No. 2: The program is located on a locked disk or volume (such as a CD-ROM)

WRITE TO HELP FOLDER/TIPS

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or on a damaged disk or volume. Make sure the disk PageMill resides on is unlocked and writable. If the problem persists, run Disk First Aid or Norton Utilities' Disk Doctor to detect and fix any disk-directory damage.

BOB: The last possibility is that the program itself is damaged. Try reinstalling PageMill, to a different disk if possible.

Tips / Browsers

Caching with ShrinkWrap

I read with interest Greg Gabelmann's solution for storing Netscape Navigator cache files in RAM, in the October online edition of *MacUser*. [For those who missed it, Gabelmann suggested using Mark Adams' \$15 shareware program *AppDisk* to store cache files in RAM for faster access. — Ed.] I've discovered that you can use Chad Magendanz' *ShrinkWrap* 2.0 to perform the same trick.

Open *ShrinkWrap*'s Preferences, and under Destination, select Desktop Folder. Also check both "Keep mounted images in RAM" and "Mount images unlocked by default." Now press Command-N to create a new image file. (Your image file should be large enough to hold a fair number of cache files but not so large that you eat up too much of your available RAM.) Name the image file, and move it to the Startup Items folder inside your System Folder. Open Navigator's Network Preferences and designate the virtual disk you just created as the location for Navigator's cache.

With its prior contents intact, the *ShrinkWrap* virtual disk will mount automatically at startup, and Navigator will be able to retrieve its cache files much more quickly.

Denis Lose
via the Internet

Off-Line Reading

One of the drawbacks of reading information on the World Wide Web is that you must maintain an active Internet connection to view pages as their designers intended — complete with graphics and proper layout. Saving pages as source files does only half the job — you get the text properly laid out, but the graphics are missing unless you download them individually.

An alternative for those who own the full version of Adobe Acrobat is to print Web pages directly to PDF files, using the Acrobat PDFWriter driver. Just select this driver in the Chooser and choose Print from your browser's File menu. Name the file and save. After a somewhat substantial delay (depending on how big the page is), a PDF file containing the image of the complete Web page will be saved to disk. To browse off-line, open the file with Acrobat.

Matt Henderson
via the Internet

[You can read and print complete Web pages off-line by using *WebBuddy* (\$75, DataViz) or *WebWhacker* (\$69, ForeFront) to automatically download all the text and graphics files that make up the page (or pages) you're interested in. Just open one of the HTML pages with your browser, and print to your heart's content. — Ed.]

Nothin' but Net

Q. My friend and I live about four miles apart. Is there any way to network our computers for playing games?

Russell Green
via the Internet

CHRIS: Why sure, but it won't be by stringing a *really* long cable between your two dwellings. Because you live farther apart than the allowable limits of a real network, you'll have to rely on a modem and your phone lines.

BOB: Wow, I get to suggest two cheap solutions in one column! Try *NetLink Remote*, a \$10 shareware extension from Joe Kloss. The idea is simple: *NetLink* fools your Mac into thinking your modem is a node on the network. Just select *NetLink* in the Network control panel, dial up your buddy (that person must have his or her own registered copy), fire up your network game, and play on. What's the catch? Games such as *Marathon* that require a fast, real live network will perform at less than optimal speed over a modem connection — even if you're both using 28.8-kbps modems.

CHRIS: Harrumph. I guess I have to mention the pay-to-play options. Russell, Internet gaming has a lot of potential, but so far not much of it has been realized — discounting text-based games such as MUDs, of course. Bandwidth and line noise are still a problem, as is the occasional eight-year-old punk who invariably blows you out of the sky while you're desperately trying to figure out which key engages the AIM-9 "Sidewinder" missile on your F/A-18. Yea verily, although Internet gaming has a long way to go, you have a few commercial options.

Sim-Net offers a service, *Sim-Net Online*, that, for 75 bucks per annum, lets its users log onto its server and play such games as *F/A-18 Hornet*, *A-10 Attack!* *Cuba*, *Descent 1*, *Links Pro*, *Bolo*, and *PowerPoker* against human opponents. Games are not included in the service — you must have your own copies. Check <http://www.simnet1.com/> for more info.

GameNet, another online outfit, offers the same kind of service — you play the games you own over the Net. It's located at <http://www.gamenet.com/>.

To play such games as *Spaceward Ho!*, *Hearts*, *Go*, *Chess*, and *Backgammon*, log into *Outland*. Unlike *Sim-Net* and *GameNet*, *Outland* provides you with these games in its downloadable software package. To play, pay your \$9.95 per month and log in for unlimited fun at any time of day or night. *Outland* can be reached at <http://www.outland.com/>.

What For Art Thou?

Q. How can I figure out what those mysterious extensions and control panels in my System Folder are for?


Jefferis Peterson
via the Internet

CHRIS: It just so happens that there is more than one way to de-fur this feline. If you're connected to the Net, I can recommend two great sources of information.

Point your browser to Dan Frakes' *Mac Pruning Pages*, at <http://www.AmbrosiaSW.com/DEF/>. Here you can read in intimate detail about every Apple extension and control panel you're likely to encounter. Included in the descriptions are indications of whether a particular dingus is disposable as well as whether it's of recent vintage. If you don't care to read the document online, you can download a copy of Dan's *InformInit*. This \$10 (and worth it!) shareware guide contains the site's information organized in a stand-alone *DOCMaker* file. You can FTP *InformInit* directly from <ftp://ftp.AmbrosiaSW.com/pub/DEF/InformInit.hqx>.

Jason Haas' *Macintosh Extensions Guide* is another worthwhile online guide to Apple's add-on thingies. You can find it at <http://www.madison-web.com/ext/>. Jason tells you who needs a particular extension or control panel (*EtherTalk Phase 2* for those with Ethernet connections, for example), the OS version necessary for the extension or control panel to operate, its function, and a link to related extensions and control panels. You'll also encounter an occasional nifty screen shot.

BOB: Regular readers of *MacUser* will also want to flip their August '96 issue open to page 115 to review Ted Landau's article "System 7.5.3 Cleanup." Therein you'll find references to many of Apple's latest additions.

And where would we be without our almost monthly tribute to Casady & Greene's *Conflict Catcher 3*? "Catch 3" provides terse descriptions of most extensions and control panels. Just open the *Conflict Catcher* control panel and click on a file's name to get the scoop. 

Bob LeVitus is the author of 20 computer books and is a columnist for the Houston Chronicle. Christopher Breen recently coauthored The Macintosh Bible Guide to Games, published by Peachpit Press.



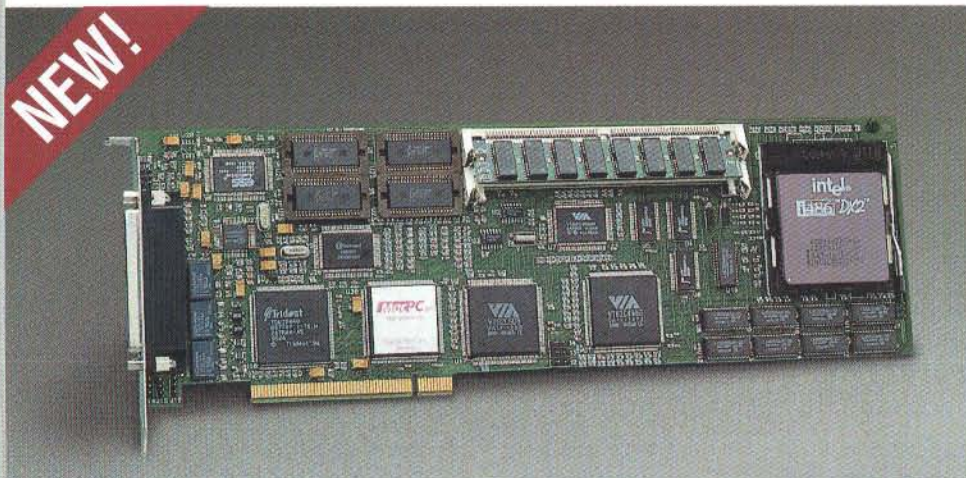
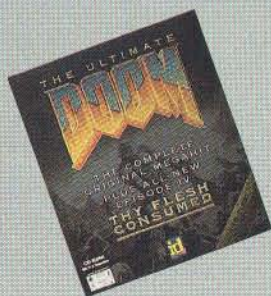
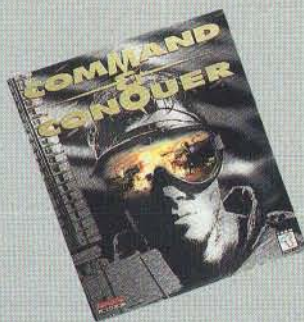
You can find the shareware and freeware programs referenced in this article at *MacUser's Software Central* (<http://www.zdnet.com/macuser/software/>). You can also find them in the *MacUser* areas on CompuServe (GO ZMC:MACUSER) and America Online (keyword MACUSER).

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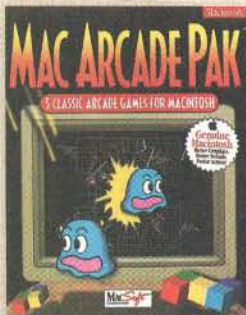
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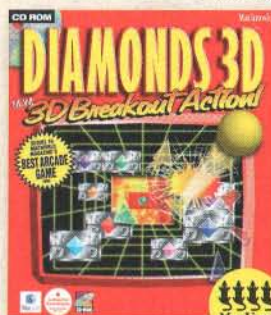
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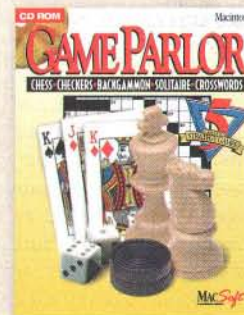
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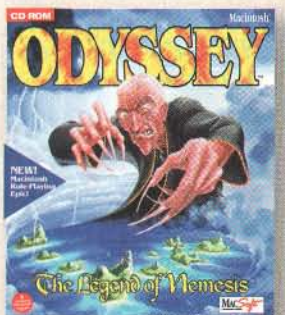
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GIFT GUIDE

If it's visions of rejected gifts rather than sugarplums that dance in your head, let us help with a few sure-to-please gift ideas.

IT'S THAT WONDERFUL TIME of the year again. Time to brave the icy winds, the traffic jams, and the grumpy shoppers who'd rather be in front of a fireplace sipping hot cocoa than marching up and down a shopping mall. Ah, yes, we too can't wait to search from store to store for

umpteenth perfect gifts to satisfy those nearest and dearest to our hearts, not to mention those we don't really like much but have to buy gifts for anyway. As that list of gift recipients grows longer and longer, let us help you choose some inexpensive gifts before you ever step out of the house.



WITH 2-MILLION-PLUS lomega Zip-drive owners out there, chances are you've got one or more of those people on your gift list. Show those people you care with an accessory or two that'll make their Zips' lives a bit more stylish, comfortable, and — dare I say it? — zippy.

For traveling Zipsters, how about a **Zip carrying case** — either the drive-size small version (\$14.95) or the large one (\$29.95), big enough for the drive, power brick, cables, and a few cartridges? Portability is more than just an attractive carrying case, though — it's also the freedom from wall sockets provided by the **Zip Unleashed!** rechargeable battery pack (\$49). Also invaluable for travel is the compact **Universal Power Switching Supply** (\$39.95), which can be used most everywhere in the world.

Back at home, a **Zip Disk Caddy** (\$9.95) will prevent desktop clutter and a pack of three **Zip Jewel Cases** (\$2.95) will replace the inevitable misplaced cases. If that's just too practical, you could wow 'em with an

lomega Golf Umbrella (\$18) or **Sports Bag** (\$25) — or even a set of two **lomega coffee mugs** (\$10). No matter what finery you choose, just call lomega at 800-818-9728, ext. M21, or 801-778-1000 to place an order.

/ RIK MYSLEWSKI

REMEMBER WHEN you received your first camera? Mine was a blue Brownie (go figure), but I still remember the delight of ripping open the paper to see that Kodak box. This year, give the computer fans in your life their first Kodak digital cameras. **Kodak's Digital**

Science DC20 (\$395) is a pint-sized point-and-shoot digital camera that's perfect for budding digital artistes. Its limited image quality makes it more suitable for Web pages than for print pieces, although it's fine for personalized thank-you notes and secret club newsletters. It makes a good combo with Kai's Power Goo. 800-235-6325 or 716-724-4000. / PAMELA PFIFFNER





STRUGGLING TO FIND the right gift for that psychedelic someone who's into VW vans; tie dye; and making love, not war?

For about \$50, you can get **Kai's Power Goo**, from MetaTools (800-472-9025 or 805-566-6200). Power Goo turns still pictures into fluid images you can twist, turn, shrink, and bulge. You can also combine images for knee-slapping results or import pictures of your family and friends and subject them all to the Jim Carrey treatment.

For a complete Goo Gift Pack, you'll also need to give the tool that sets the proper mood for all that gooning: a **Lava Lamp** (\$50), from Lava Lite (800-352-5282 or 312-237-5700). / **ROMAN LOYOLA**

A LONG TIME AGO, in a galaxy far, far away, getting a great gift for avid Mac gamers was a challenge worthy of a Jedi Knight. Luckily, Mac games are today truly becoming a Force to be reckoned with, and nowhere is this more obvious than with my favorite game of 1996: LucasArts Entertainment's **X-Wing Collectors CD-ROM** (\$29.95). Besides coming up with one of the most detailed and playable sci-fi simulations on any platform, LucasArts built X-Wing Mac to take full advantage of the Mac, with better graphics and 3-D rendering than the Windows version. 800-985-8227 or 310-264-5579.

You need a joystick to play this game right, and CH Product's **FlightStick Pro** (approximately \$80) is my favorite. As a left-handed gamer, I especially appreciate the FlightStick's ambidextrous button configuration. 800-624-5804 or 619-598-2518.

The finishing touch for the star-fighter jockey on your holiday gift list is a scale-model X-Wing to go on top of a monitor. Micro Machines' **Star Wars Action Fleet** offers an excellent prebuilt one for around \$10. You should be able to find the Micro Machines models in any of your favorite toy stores. / **ANDREW GORE**

FOR THAT MEMBER OF THE FAMILY who snaps photos in rolls per minute at every family gathering, I have the perfect item: Storm Technology's **EasyPhoto Reader** (around \$200). This compact color scanner for

snapshots offers an inexpensive and convenient way to get photos into a Mac. It's small and light enough to hold in one hand, and it comes with basic image-editing software that will get the red-eye, and other minor defects, out. Once a photograph has been enhanced, images can be cut and pasted into anything you want, from greeting



cards to family newsletters. 888-438-3279 or 415-691-6600.

Another gift idea I recommend, because it can actually save you money, is Vocaltec's **Internet Phone**. Your long-distance bills will quickly decrease if you treat yourself and those you call long distance to a copy of this package. For the price of the software (about \$50) and your Internet connection, you can call your brother in Japan or your cousin in Italy, using your Mac and the Internet. Your cousin's running Windows? No problem; Internet Phone can work across platforms. 800-843-2289 or 201-768-9400. / **SUSAN JANUS**

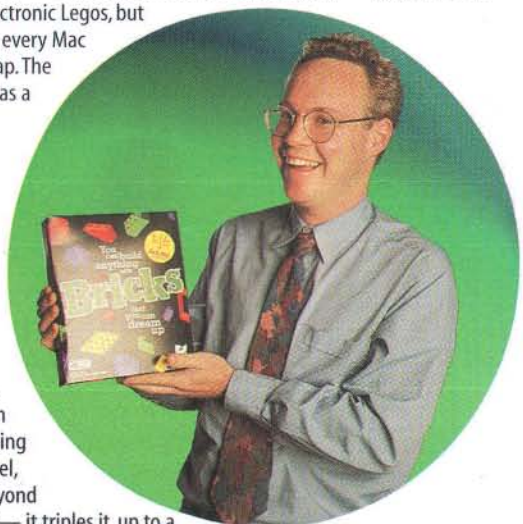


YOU MUST HAVE one of those friends who's not a programmer but is kind of a know-it-all. You know, the one who likes to brag about logging into an Internet account from a UNIX

command line and about learning HTML without the help of "sissy" WYSIWYG tools. Isn't it about time you challenged your pal? **Learn Java for the Macintosh in 21 Days** (\$40; Indianapolis: Hayden Books, 1996) promises to take readers to the bleeding edge of Internet programming before the rent is due next month. The development environment (Roaster, from Natural Intelligence) is included with the book. / **SHELLY BRISBIN**

THE SECRET TRUTH IS that we all want Legos but won't admit it. Finally, our desire can be satisfied — maturely — with **Gryphon Bricks** (around \$40), a 3-D virtual construction set. This program, from Gryphon Software, is even cooler than Legos, with more than 200 styles of bricks, including arches, doors, and human figures. Grab, drag, rotate, and nudge bricks to build 3-D creations. Even make a QuickTime animation of the project's construction. Best of all, this game puts an end to some familiar Legos pitfalls: You never run out of bricks, and they don't get lost under the furniture for the dog to snack on. 800-795-0981 or 619-536-8815.

This next gift idea — Connectix's **RAM Doubler 2** (\$99) — may not be as entertaining as electronic Legos, but it's an essential for every Mac owner and it's cheap. The previous version was a best-selling Mac product that alleviated the hunger pangs of many memory-hungry Macs. So, chances are that some people on your holiday list already know and love it. Version 2 is an even better item to fit into the stocking tacked to the mantel, because it goes beyond doubling memory — it triples it, up to a maximum of 256 MB. You should get no glum looks even after the recipient of RAM Doubler 2 has spent time using your thoughtful gift, since Macs running this latest version are as speedy as those running the previous version. While you're at it, sneak a copy into your own stocking and sign it **Santa** — **MacSanta**, that is. 800-950-5880 or 415-571-5100. / **JIM SHATZ-AKIN**



Until now, the on-ramps to the Internet have been under construction.



Introducing the Apple Internet Connection Kit.

Getting hooked up to the Internet can be a messy process. That is unless you've got exactly the right tools. Presenting the Apple® Internet Connection Kit. It's everything you need to get on and get around the Internet quickly, easily and with a minimum of frustration. Here's what you receive: Netscape Navigator™, Claris EMailer™ Lite, Progressive Networks RealAudio, NewsWatcher, Fetch, the Apple Internet Dialer, Quicktime® VR Player and more. Plus, if you come across anything you don't understand, Apple Guide on-line help is there to assist you right away.

Just think, 30 minutes after opening the box, you could be participating in discussion groups, E-mailing Aunt Helga in Denmark, visiting the Louvre, the Library of Congress or maybe even the local chicken joint. (Seems like everybody's got a Web site nowadays.)

Visit your Apple reseller, or order direct by calling **1-800-950-5382 ext. 784**. And when you do get on the Net, check out our Web site at <http://www.apple.com>.

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NETSCAPE





SANTA'S HANDS TOO SORE to stuff stockings this year? Help him or Mrs. Claus relax their overworked mouse-hand on a **Comfort Point** (about \$25), from GBM Design. This cushioned, contoured platform supports your hand as it skates behind your mouse, trackball, or keyboard, tethered by a small Velcro tab. This device helps you avoid painful wrist strain in two ways — your wrist stays flat, and you use your fingers to push your mouse rather than squeeze it. This hand-y ergonomic gift is especially appropriate for designers and other heavily

mouse-dependent folk. Available in lefty and righty versions, all in basic black. 800-429-3746 or 310-305-8931. / **SCHOLLE SAWYER**

EMBARRASSED BY FRIENDS who look clumsy and unhip toting laptops in boring black shoulder bags? Give a boost to fashion-underachievers with a Respect **LapPak** (\$98). The LapPak injects funky chic into the world of the computer user with four styles, including my favorite: groovy red and black with racing stripes. It's padded to protect your friend's "PowerBaby" and has quite a bit of storage for disks, business cards, pens, and even a beeper and cell phone. The padded shoulder straps zip off to transform the backpack into a briefcase, and a built-in detachable wrist pad makes typing more comfortable. 415-512-8995.

/ **BROOKE WHEELER**



IF STUPID SITCOMS, music videos, or a liberal-arts education have filled the mind of anyone on your gift list, then the ideal gift for them is Jeopardy's racy twin brother — **You Don't Know Jack X-tra Large** (about \$40), from Berkeley Systems. If you're lucky, you might get to join in on a game, since it allows up to three players, and prove your knowledge of such topics as Mathematics and Sports Involving Ugly Pants or Fun Things to Stick in a Blender. 800-344-5541 or 510-540-5535.

How did former Apple president John Sculley betray the Mac? What did the first Apple Computer logo look like? What ever happened to the original Mac team? You'll get the answers to these questions and many more in the endlessly entertaining book

The Mac Bathroom Reader (\$12.99; San Francisco, CA: Sybex, 1994). It contains anecdotes about the personalities and the circumstances behind the Macintosh; its precursor, the Apple II; and other early personal computers. 800-227-2346 or 510-523-8233. / **CAROLYN BICKFORD**



The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

JIM: A sad lad had a flask.

RIK: New screenplay for Nicholas Cage?

JIM: No. I'm learning to touch-type with this month's batch of programs.

RIK: Ah. Only learned the middle tier of keys, eh?

JIM: Yep. But I'm progressing fast. All four programs offer good tutoring in typing basics.

RIK: But what counts in a home app is extras that encourage practice.

JIM: That — and, if possible, some bonus educational value to boot.

RIK: The Learning Company's **Read, Write & Type!** serves up both.

JIM: Right. Its virus-zapping game combines phonetic reading skills with keyboarding — great for prereaders.

RIK: But for older kids, arcade action boosts practice, right?

JIM: Well, maybe. The other three programs all offer game play — but with mixed success.

RIK: The BlastOff game in Sunburst Communications' **Type to Learn**, for instance ...

JIM: Great graphics, sloooooow game play.

RIK: Thomson Learning Tools' **PAWS in Typing Town** offers lots of arcade games.

JIM: But typing has little to do with game play: Fast, accurate typing earns you credits (such as racing fuel or game-clock time) — then you play a 30-second mouse-based game.

RIK: *Yawn.* So were any of the games good?

JIM: My favorite was the Missile Command-like game in Davidson's **Typing Tutor 7**: You type words as they drop from the sky to prevent them from hitting your cities.

RIK: Hmmm. Who'd ever think typing would be fun?

JIM: Glad dad.

PAWS in Typing Town ★★☆☆

Ages: 8 and up.

Price: \$35 estimated street (CD-ROM). Sound typing-instruction lessons are incompletely integrated with keyboard-based arcade games, a Journal word-processing module (with clip art), and QuickTime movies of proper keyboard techniques. Game activities don't match well with student skill level.

Company: Thomson Learning Tools, Cincinnati, OH; 800-824-5179 or 513-271-8811; <http://www.thomson.com/tltools.html>.

Reader Service: Circle #420.

Type to Learn, Home Version ★★☆☆

Ages: 7 and up.

Price: \$30 estimated street (CD-ROM). Good blend of solid instructions and fun activities — although BlastOff spaceship game takes far too long to move between scenes. Word processor is very good but feels detached from the rest of the program.

Company: Sunburst Communications, Pleasantville, NY; 800-786-3155 or 914-747-3310; <http://www.nysunburst.com/>.

Reader Service: Circle #422.

Typing Tutor 7 ★★☆☆

Ages: 12 and up.

Price: \$30 estimated street (CD-ROM). Noncartoony design is well suited for adults, older kids. Fun, fast-paced Missile Command-style game is the best of the bunch. Games match well with lessons. Excellent progress reporting lets you isolate areas for practice.

Company: Davidson/Simon & Schuster, Torrance, CA; 800-457-8357 or 310-793-0600; <http://www.david.com/>.

Reader Service: Circle #423.

Read, Write & Type! ★★☆☆

Ages: 6 – 8.

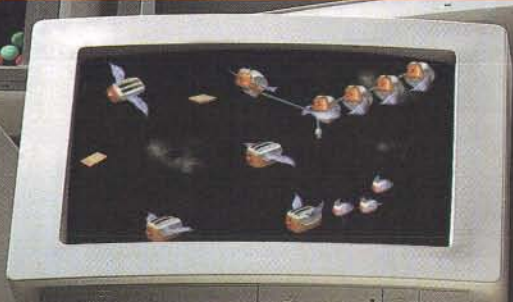
Price: \$50 estimated street (CD-ROM). Cutesy-but-clever game format combines typing exercises with early-reading lessons: Keys represent sounds as well as letters. You tell increasingly elaborate stories by accumulating keyboard knowledge.

Company: The Learning Company, Fremont, CA; 800-227-5609 or 510-792-2101; <http://www.learningco.com/>.

Reader Service: Circle #421.



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The Game Room

BY ROMAN LOYOLA

YOU'LL LAUGH, YOU'LL CRY — heck, you'll even find yourself lost on a non-Gilligan-related deserted island or in a haunted museum in this month's Game Room. And just for kicks, I'll throw in a little tour of LucasArts' game lab and a sneak peek at what's next from the folks who brought you X-Wing.

Don't Quit Your Day Job

Remember the stand-up-comedy boom of a few years ago? People were flocking to clubs, and TV shows featuring stand-up comics and their routines were on every channel. Like most fads, the stand-up-comedy boom ended — maybe because too many comics were stealing other comedians' acts; maybe because of overexposure; or maybe because if it hadn't ended, you wouldn't have been able to call it a fad.

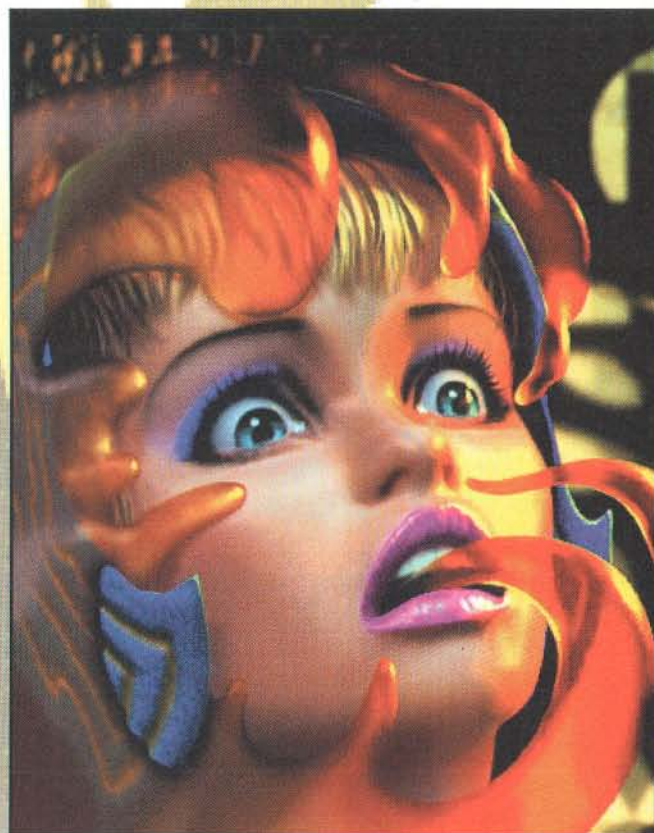
Don't Quit Your Day Job came out a few years too late. It's a game that probably would have prospered during stand-up comedy's glory days back in the '80s. You play a talent scout for a late-night TV show who needs to book a comedian — a really good comedian — or lose your job. You head off to the world-famous Improv comedy club in search of the latest star.

Because you're the new kid in town, Bud Friedman, the owner of the club, won't let you inside to the main stage — you have to have the right connections. You get those connections by exploring the exterior lobby of the Improv and talking to people. But, as all comedians know, timing is everything, and you have to be sure you talk to the right people at the right time. Approach someone at the wrong time, and you get sent to Hell's Basement, where you must explore The Curse of the CD-ROM Hallways.

As a game, Don't Quit Your Day Job is a total joke. Talking to the characters can be amusing, but when every sentence is a play on words, it gets tiring fast. The animation is primitive, and the interface lacks finesse — walking down a hallway can be a chore.

The walls of the club are plastered with photos of comedians. Click on a photo, and you get to watch a short monologue, which is much more fun than playing the game itself. Clips from Steven Kravitz, John Mendoza,

and other comedians are very entertaining. One thing you notice after watching a few clips is that poking fun at one's own heritage or ethnic background is a prevailing theme, and if you're the sensitive type, which I'm not, you may be offended.



When you get sent to The Curse of the CD-ROM Hallways, you're treated to a spoof of a video game. One parody, called Missed, is basically a series of underwhelming rendered graphics. Once you finish one of the parodies, you get sent back to the lobby of the Improv to try again.

Although the spoofs are cute and some of the monologues are great, it's not enough to make Don't Quit Your Day Job a worthwhile purchase. Rather than waste money on this game, spring for a visit to a comedy club. You'll have a better time.

Sinkha

Sinkha, from Mojave (formerly Strata Interactive), isn't a game — it's a graphic novel on CD-ROM. Nonetheless, Sinkha makes good use of the CD-ROM format, albeit in a limited fashion.

Sinkha is the story of Hyleyn (see figure below), a young girl yearning to escape Thalissar, the world she's trapped on. She seeks refuge with the Sinkha, godlike creatures worshipped by the inhabitants of Thalissar. Hyleyn decides to contact the Sinkha, and the story tells what happens next.

Sinkha uses the CD-ROM format to show off its gorgeous 3-D images — it would make a great coffee-table book. No detail was spared, with the landscape, spacecraft,

of Brian Eno's Ambient series, but it does a good job of setting the mood.

Where Sinkha fails is in the story. It's just not that interesting. There are lots of holes that leave you confused, and the writing is, well, even more stilted and sloppy than that of the average graphic novel. Fortunately, there's a Web site dedicated to the story of Sinkha (<http://www.sinkha.com/>), and it provides a lot of information that helps make sense of the story. But it does nothing to make the story better. You can use the Web site as a kind of preview and decide for yourself if Sinkha is the type of science fiction you'd be interested in.

One point needs to be made: Many of the images of Hyleyn, identified in the CD-ROM as "a young girl," might be considered sensual. The Web site says that she *could* be 16 years old, but her true age is unknown. The overtones of pedophilia (an old man being forthcoming about his desire for Hyleyn, and images of Hyleyn in revealing, suggestive poses) can be quite powerful, if not upsetting to some. These images are by no means graphic or risqué, but some viewers may find them inappropriate. Sinkha is definitely not for younger audiences.

If you check out the Web site and like what you see, get the CD-ROM and judge for yourself — but don't say I didn't warn you. Or if you're into checking out what artists are doing with 3-D computer graphics these days, Sinkha's a great portfolio. Sinkha is also available as a printed graphic novel, which might be a better option, considering the CD-ROM version's \$50 price tag.

Odyssey

Back in junior high, I could never get into RPGs (role-playing games). Dungeons & Dragons was popular but involved a great investment of time. And, honestly, I was more intrigued by the existence of 20-sided dice than I was by any practical application for them.

You would think this lack of RPG savvy would cause me not to be a fan of any Mac RPG. However, Odyssey held my interest. In Odyssey, you play a character who has been stranded on an island and you must journey through that island, plus five others, to get home.

Odyssey's strength is in its detail. There are tons of characters to meet, lots of mystical powers to gain, and a large arsenal of weapons to exploit.

Interacting with other characters and the game environment is easy, thanks to a simple and intuitive interface. Items are stored in a Mac-like folder system, and actions have a corresponding key command. The characters you meet and talk to are interesting. The puzzles in *Odyssey* are challenging and provide you with information you need for continuing your journey through the islands.

Odyssey's weakness is in its graphics. The view of the game is from overhead, like in *Blizzard Entertainment's* tour de force *WarCraft*, but the detail isn't as fine. What graphics there are do nothing

to enhance the game play. *Odyssey* is definitely stronger on game play than it is on eye candy.

Shivers

With a name like *Shivers*, you'd think I'd get really scared while playing this game — or at least get really cold. Actually, I got really bored.

Much as I hate to make this tired analogy, *Shivers* is a *Myst*-like game (I won't compare it to *Myst*, since I think *Myst* is overrated). Your character is trapped inside an unfinished museum of mysterious, unexplained phenomena. Evil spirits roam, wreaking havoc, and it's up to

you to capture them before the night is through. The catch is you have to capture them in special pots and talismans corresponding to the element each spirit has conquered.

Most of the time, you wander through the museum, checking things out and finding clues. Eventually, you run into a dead end, and the only way through is to solve a puzzle. The puzzles are neither too hard nor too easy. However, all this wandering and puzzle solving didn't keep my attention for long.

Shivers contains some great-looking graphics. After you've finished the game, you can wander

through the museum some more. But the old "great graphics, explore, and solve puzzles" combination is just that — old. And because this combination has been done a lot in CD-ROM games, it takes a strong, interesting story line to make such games feel fresh. Since *Shivers's* story line isn't all that fresh or interesting, you can't help but feel like you've played this game before. ☹

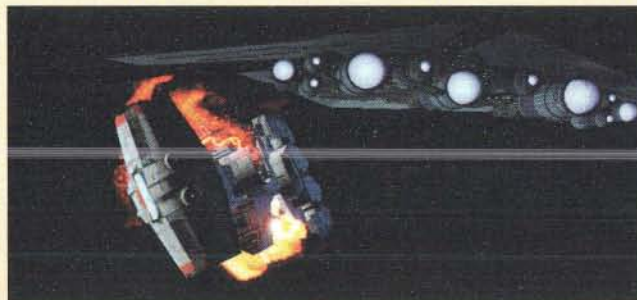
Roman Loyola gets that feeling of déjà vu a lot in The Game Room, which is why he hasn't quit his day job as an associate editor in MacUser's Features department.

Sneak Peek: A Visit to LucasArts

Sometimes it's good to get out of the house, or in this case, The Game Room. So when LucasArts invited me to visit its labs for a look at the next round of games, how could I say no? Especially when that visit included lunch at George Lucas' sprawling Skywalker Ranch. (No, I didn't catch a glimpse of the hirsute creator of *Star Wars*, although I did "do lunch" two tables away from *Batman* director/producer Tim Burton. Oh, what I won't suffer to produce the best Game Room possible.)

Among the many upcoming Mac titles that LucasArts showed me was a first-person shooter called *Outlaws*. Although most first-person shooters are based on science-fiction fantasy themes, *Outlaws* will be the first to be set in a Sergio Leone-type Western.

Instead of laser guns and futuristic cannons, your character will be armed with a six-shooter, rifles, and shotguns. Because *Outlaws* is based on an improved version of the *Dark Forces* engine, you'll be able to shoot out windows in the rustic buildings around town as well



as ride a mining car through deep tunnels, popping off bad guys as you speed by. The new engine allows for slopes and radically angular structures, something *Dark Forces* had trouble dealing with.

Expect *Outlaws* to debut as early as January.

LucasArts is also feverishly working on *Jedi Knight*, the sequel to *Dark Forces* (see figure above, left). Although I wasn't able to see the game itself, I did see some amazingly realistic character animations. I saw smoothly rendered 3-D animations of Kyle (the main character), a Greedo-type bounty hunter, and a Stormtrooper. There wasn't any noticeable frame dropping or any glitches or pixelation in the animations. LucasArts hopes to replicate these incredible character animations in the actual game, which will be the first to allow players to wield a light-saber and use the Force (the story is very



reminiscent of the classic movie *The Seven Samurai*). Judging by the trailer the company is putting together plus the production storyboards I was allowed to preview, *Jedi Knight* promises to be the best first-person shooter

(or maybe *slasher* would be more apropos) the company has yet produced. LucasArts says that it plans a simultaneous release for both Windows 95 and Mac OS systems early next year.

I also saw a beta version of *TIE Fighter* (see figure above, right), the flight simulator that puts you into the cockpit of an Imperial starfighter. If you've played *X-Wing*, you'll be familiar with the game play of *TIE Fighter*, because both games are

based on the same flight engine and have many controls in common. There will be some interesting differences as well. First off, you'll have to take into account the weaknesses and strengths peculiar to the *TIE Fighters*, as opposed to the craft in *X-Wing*, to succeed in this game. Another change is that there will be at least as many missions as there are in *X-Wing*, which has over 130. You'll get to pilot an assortment of Imperial craft, including standard *TIE Fighters*, *TIE Bombers*, *TIE Advanced Fighters*, and *Gunboats*. LucasArts is also working on *X-Wing* versus *TIE Fighter* for the Mac, which allows multiple players on a network to battle each other. Of all the things I saw during my visit, the thought of being able to take on my fellow editors with my stock *X-Wing*, showing them the true power of the Force, was the most exciting. I just can't wait.

GAME POINT

December turned out to be a tough month for titles visiting The Game Room. Take the money you'd spend on *Don't Quit Your Day Job*, and buy two tickets to a comedy club. Sinkha is a stunning graphic novel that, like a lot of its ilk, is a pretty face and very little else. *Odyssey* is an enjoyable role-playing game with a great interface. And you're better off leaving *Shivers* out in the cold. Let's just hope we'll be able to ring in the new year with a better selection of games.

Don't Quit Your Day Job ☹

Price: \$35.95 (list).

Company: Phillips Media, Los Angeles, CA; 800-883-3767 or 303-739-4131.

Reader Service: Circle #424.

Sinkha ☹

Price: \$49.95 (list).

Company: Mojave, St. George, UT; 801-652-5300.

Reader Service: Circle #425.

Odyssey ☹☹

Price: \$34.99 (list).

Company: MacSoft, Plymouth, MN; 612-559-5140.

Reader Service: Circle #426.

Shivers ☹☹

Price: \$39.95 (list).

Company: Sierra On-Line, Bellevue, WA; 206-644-4343.

Reader Service: Circle #427.

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
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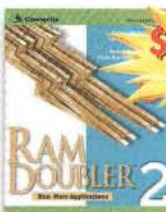
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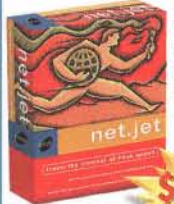


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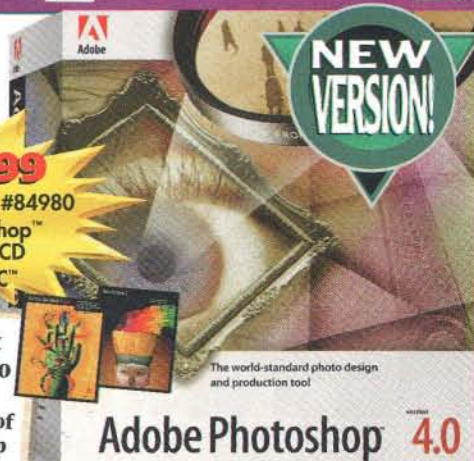
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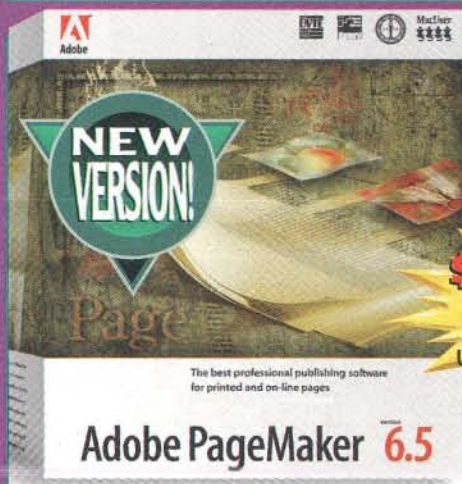
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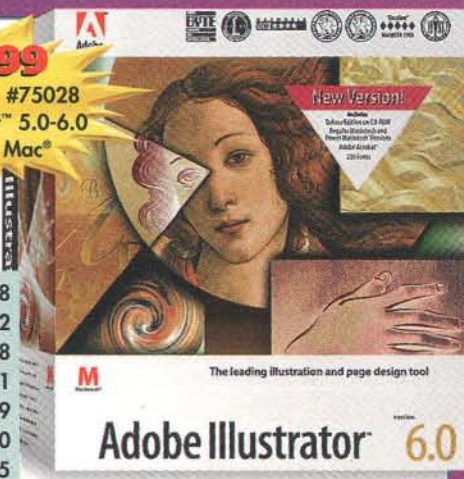
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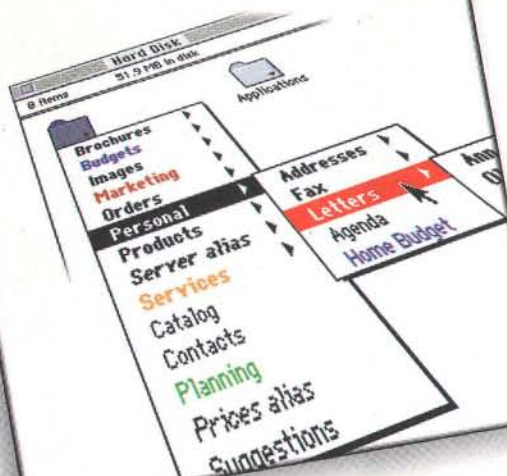
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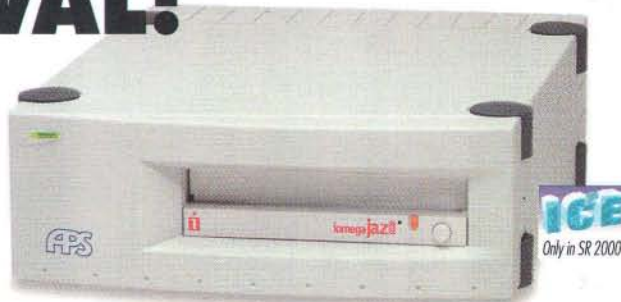


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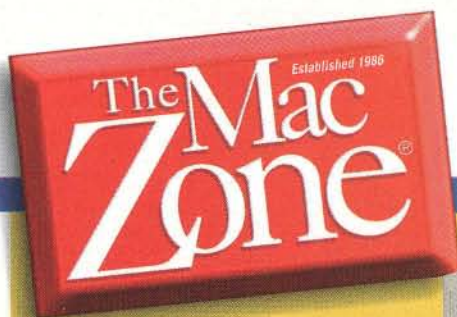
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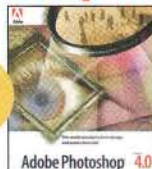
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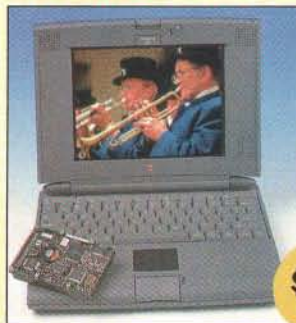
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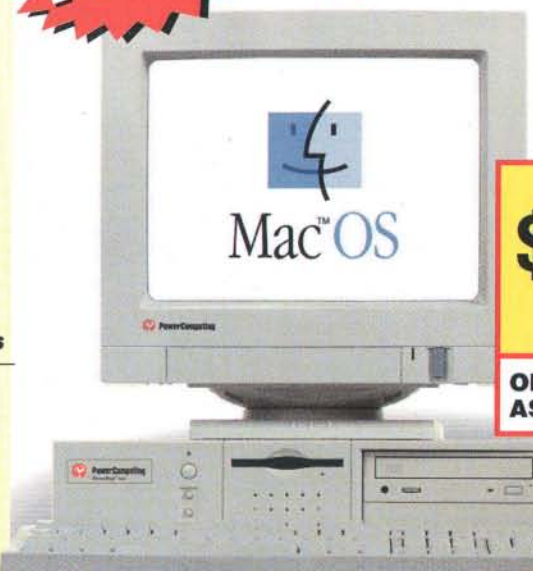


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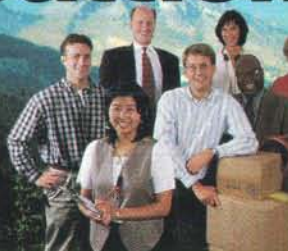


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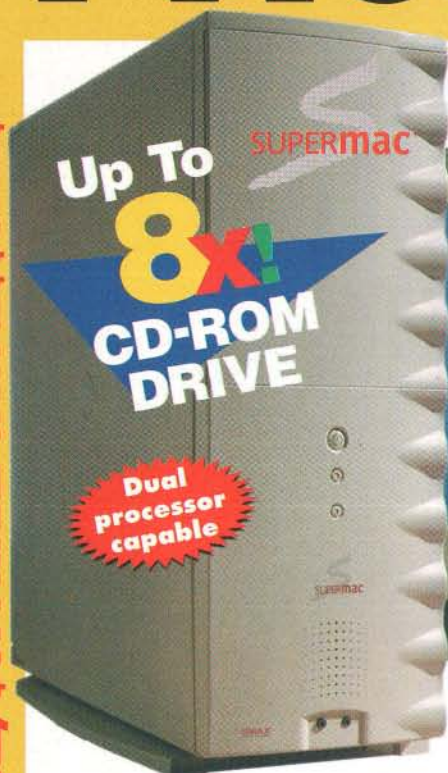
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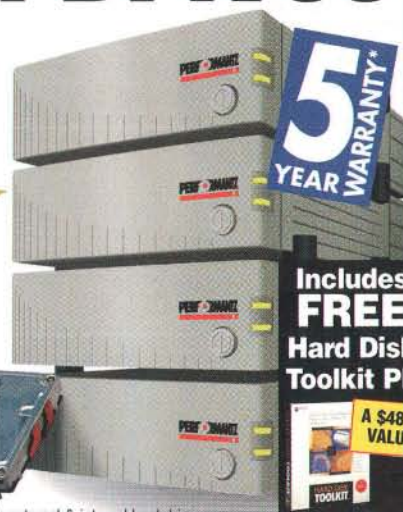
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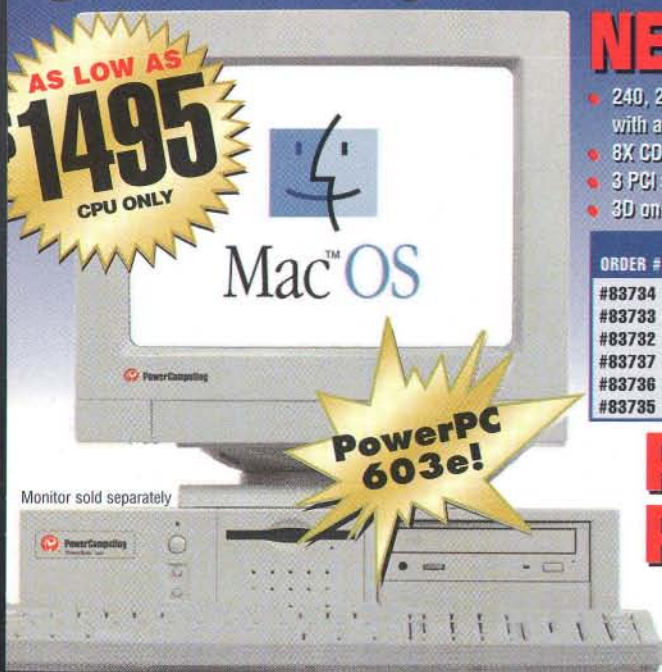
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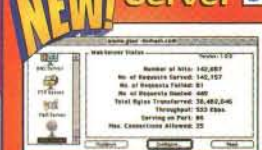
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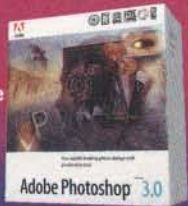
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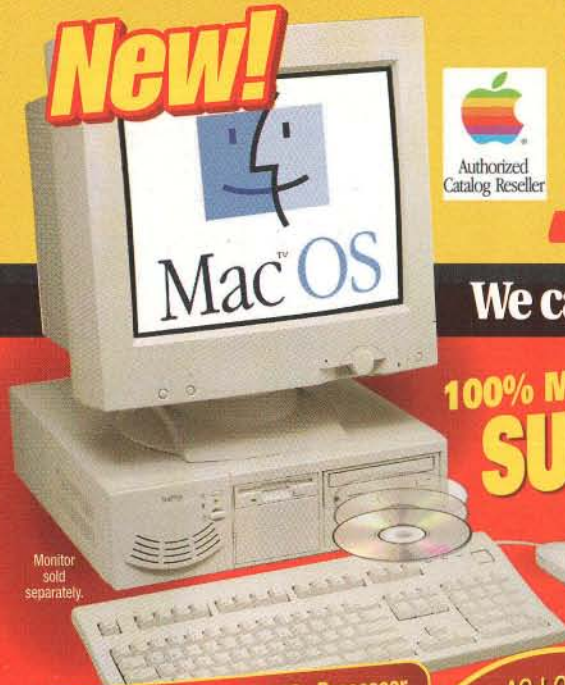
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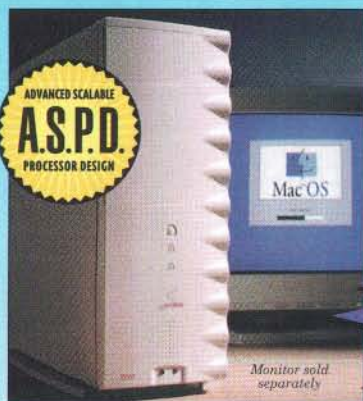
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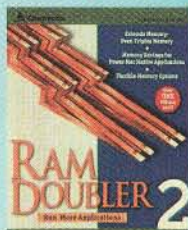
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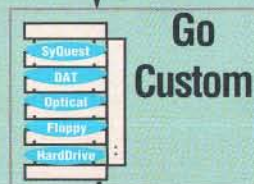


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- Yamaha 4x/4x CDR with Toast Software
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- TrueVision Targa 1000 PCI Digital Card
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- FWB Jackhammer SCSI-3 controller
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- ATI Xclaim 4MB PCI Video Card
- TrueVision Targa 2000 PCI Digital Card
- 8GB SCSI-3 Fast&Wide disk array
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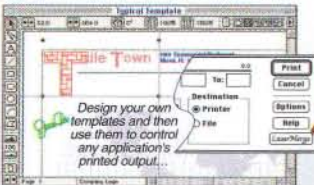
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MindGate Technologies, Inc.
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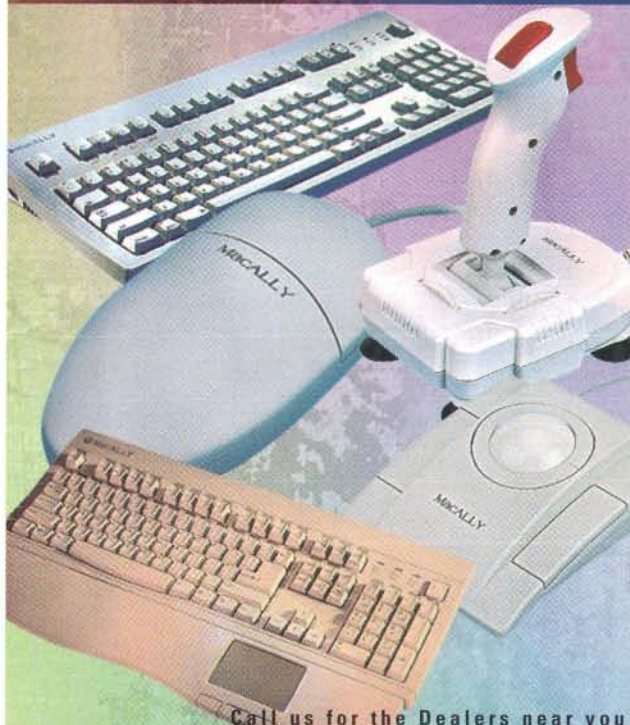
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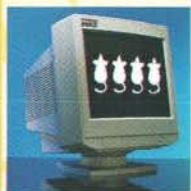
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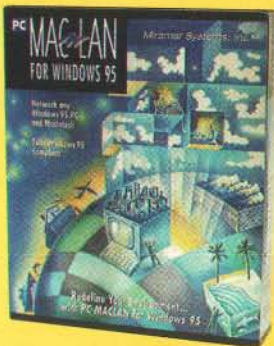
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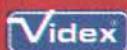
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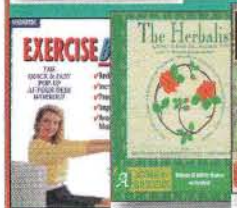


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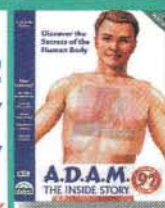


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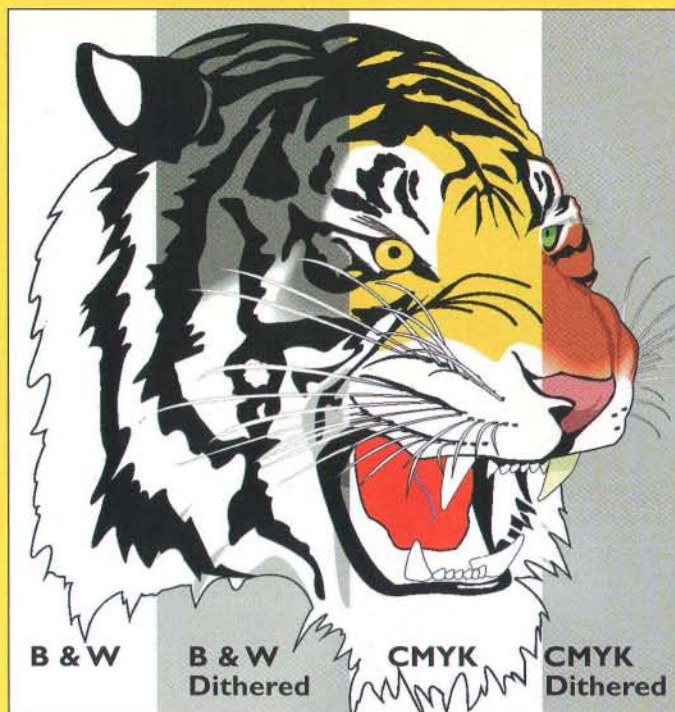
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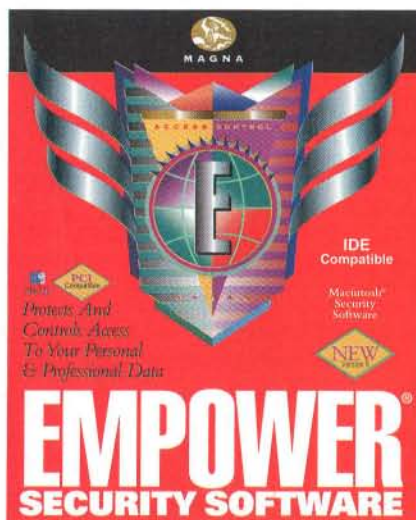
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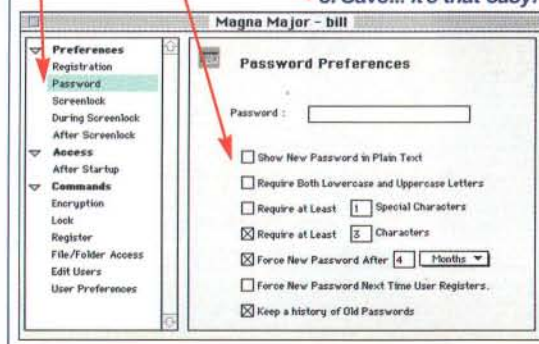
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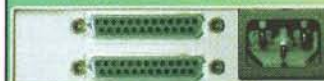
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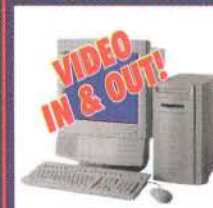
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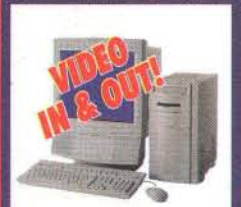
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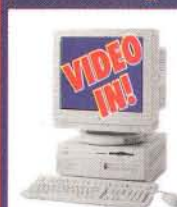
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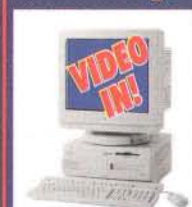
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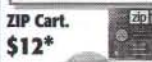
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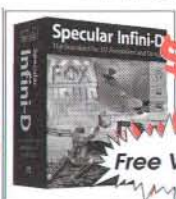
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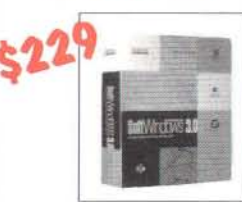
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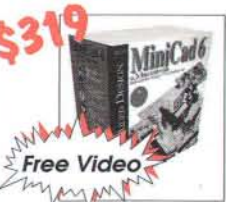
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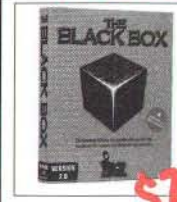
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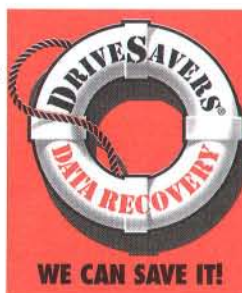
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ANDY IHNATKO

Object Lessons

ISN'T ANYONE INTERESTED in selling software any more? Is it even possible to make a profit with a package featuring manuals, disks, the whole schmear? Where's that paperback of *The Abyss* I bought on the last night of my trip? Where are all the dense, megalithic do-it-all applications scheduled to ship Sometime Next Year? Have such beasts turned into obsolete antiques, bloated out of all proportion? Maybe I left it in the seat pocket of the plane? I *know* I didn't leave it back in the hotel!

As you might guess from the above, I've just returned from a trip to yet another Industry Conference, and although my misplacing a long-out-of-print Orson Scott Card novel is indeed a mighty blow, it certainly doesn't overshadow my concern about the State of the Software Industry. I mean, in the good old way-hey-heydays, you could throw a credit card up in the air, and when it left your fingers T-shirts promoting a new spreadsheet would be printed, betas would be released at the top of the card's arc, marketing managers borne aloft on gilded wings would snatch the card and process your order just after its apogee, the company would have its first IPO in the middle of the card's return earthward, and it would then go completely out of business by the time the card returned to your hand.

From the looks of things today, though, a software company would sooner be seen wearing white after Labor Day than come out with an actual software package. No kidding — it's almost impossible to find a major software package that isn't being converted to either Java or OpenDoc Live Objects or even being metamorphosed completely into an API instead. There's a straightforward reason for this shift, of course. All these new developments in "component software" are just a logical solution to the longest-standing maxim in the

software industry: End users are trouble.

The component technology that has received the most attention from the trendy newsweeklies is, of course, the Web. "This



business of buying and installing software on your home computer is out, out, out," they write. "In the year 2000, all program components and data will be on a software company's Web server, requiring users only to install a generic browser program that runs those components remotely!" (These articles always end by claiming that this will leave us more time for riding in our personal atomic heligiros, of course.)

It's an intriguing possibility, to be sure, but one that's doomed to failure for the following reason: From the point of view of software publishers, it's an immense hassle to have hundreds of thousands of users demanding help to get their software installed and working properly. But if all the publishers converted to this Web scheme, they'd find themselves in an even worse situation — that of having their financial well-being tied to their ability to keep their own software up and running. I mean, if they knew anything about *that*, they'd be end users instead of publishers. So don't count on Web-based solutions gaining any sort of significant foothold.

Here in Mac-land, of course, the future is painted in terms of OpenDoc *containers* that exploit Live Object components. Apple is certainly pushing the technology, moving its entire Internet infrastructure to OpenDoc and stressing OpenDoc's importance to System 8. And here, software publishers seem to have hit upon a winner: Live Objects are physical things they can actually ship far, far away from corporate headquarters while still being able to pass the buck when the Live Objects fail. "After all," the publishers will say, "they're just *components*. You want to talk to the folks who sold you the container application."

A Fatal Flaw

And here's the fatal flaw in the whole scheme: For OpenDoc to be that wonderful underground railroad carrying developers far, far away from blame and responsibility, the Industry is going to need one phenomenal patsy. One incredibly dim and star-crossed company to write that one major container app to which all the other Live Object developers can innocently forward every last incoming bug report. And where are you going to find such a company, now that Atari is no longer making personal computers?

Finally, we have the ubiquitous application-programming interface. An API is a formalized definition of all the features, hooks, and subroutines supported by a major piece of software and is licensed to other developers who then go into business writing extensions to that software. It's a cutting-edge concept and sure to become the defining technology for component software, because it allows software companies to create a salable product out of nothing more than a vague description of the sort of major software release they'd *like* to write someday. It also means that I can finally make some money from *Clavin*, the mail-handling program I designed years ago but never actually got around to coding. Why, with the addition of the suffix *API* and some judicious photocopying . . .




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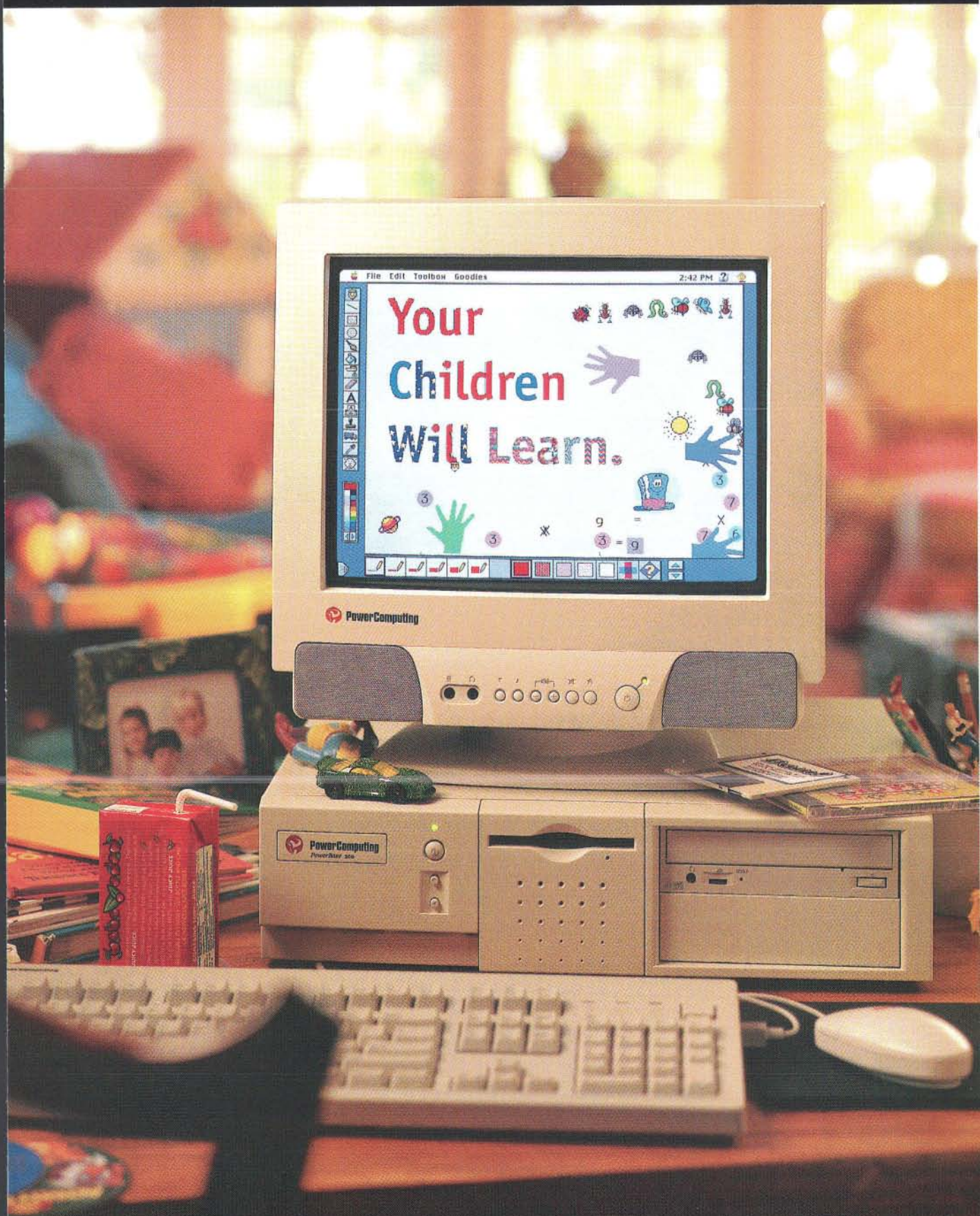


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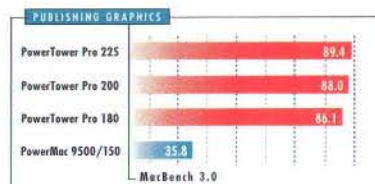
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